



QST

devoted entirely to

AMATEUR RADIO

December 1997

Official Journal of
The American Radio
Relay League

QST reviews:

2-meter "no frills" H-Ts

Keyboard CW—without
a computer

**New Ham
Companion:**

Practical
information
for all hams

**Build a simple 6-meter
receiver**

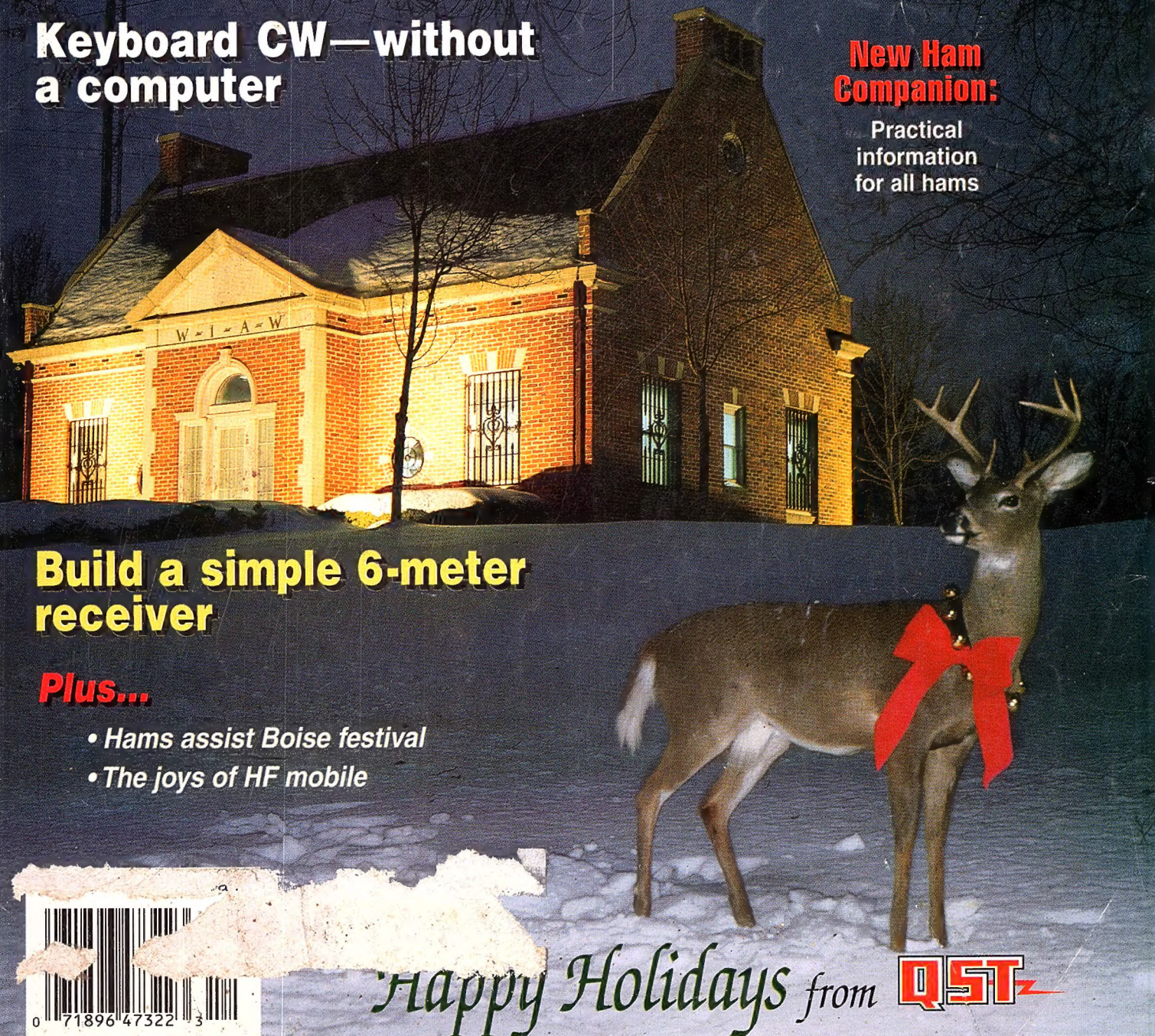
Plus...

- Hams assist Boise festival
- The joys of HF mobile



Happy Holidays from **QST**

\$1-



**FREE
OPC-581
Separation
Cable**

When you purchase a new IC-706MKII
from an authorized ICOM dealer between September 15, 1997
through December 31, 1997. See your dealer for complete details.



ICOM IC-706MKII

Base station performance with mobile-sized versatility

The ICOM IC-706MKII HF/VHF all mode transceiver is a powerful combination of next generation technology and ICOM's time-tested craftsmanship. Whether you use the IC-706MKII for base station activity, for mobile operations or on DX'peditions you can't go wrong.

Compact Design

Extremely small and compact, this radio packs all of the features of a top class HF rig in a mobile-sized unit.

- Dimensions: 167(w) x 58(h) x 200(d)mm (6-9/16 x 2-9/32 x 7-7/8 inches)
- 2.5 kg (5.5 lbs)

HF+6M+2M

Cover all modes (SSB, CW, RTTY, AM and FM) from HF to 6 meters AND 2 meters. A powerful 100 watts of output power on HF and 6 meters with 20 watts on 2 meters.

Easy Operation

Switch bands with the touch of a button! The individual band change keys provide quick and easy QSY – the SUB DIAL for easy second VFO operation and RIT adjustment control. Each band stores pre-amp/attenuator and tuner ON/OFF settings.



Other Great Features:

- Enhanced 0.03-200 MHz broadband all mode receive
- Slots for 2 optional crystal filters
- Quiet Thermally Controlled Cooling Fan
- Crossband Split Operation
- Superior Transmit Audio Characteristics
- Large Speaker
- Tone Squelch (option UT-86 required)
- New 350 Hz RTTY Filter (opt.FL-232)

- Detachable Front Panel (Option OPC-581 required)
- "S" menu for quick access to 3 bands
- Built-in CI-V serial communications port
- Spectrum Scope
- IF Shift
- Narrow-FM
- 102 Memory Channels with Alphanumeric Display
- Large Dot-Matrix Display
- Optional UT-102 Voice Synthesizer
- Optional AT-180 Antenna Tuner
- Optional PS-85 DC Power Supply
- And Much More!



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or call 425-450-6088
for a brochure

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• **GREAT AUDIO
THAT FITS MOST ANYWHERE!**

- 45 W VHF (2M), 35 W UHF (440 MHz)
- One Touch Band Selection
- Wide Band Rx (Air Band, Too!)
- 9600 BPS Packet Ready (6 pin connection point)
- CTCSS Encode/Decode
- 162 Memory Channels
- High Scan Speeds
- Built-In Duplexer
- Auto Repeater
- Optional Infrared Wireless Mic (opts. HM-90 + EX-1759)



ICOM options required for PC cloning:
CS-207 Cloning Software,
OPC-646 Cloning cable
A third party 6-pin serial cable is
required for PC packet connection.



← Under 4 1/2 inches wide! →
Front Panel: 4 11/32(w) x 1 17/32(h) x 1 1/16(d)

IC-207H
Easy Dual Bander

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ICOM options required for PC cloning:
CS-2710 Cloning Software,
OPC-646 Cloning cable.
A third party 6-pin serial cable is
required for PC packet connection.



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Advanced Dual Bander

- **"BULLET PROOF" CONSTRUCTION!**
- 50 W VHF (2M), 35 W UHF (440 MHz)
- Wide Band Rx (Air Band, Too!)
- Independent Band Display Readouts, Volume and Squelch Knobs, and Function Switches
- 50 CTCSS Frequencies
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- 220 Memory Channels
- High Speed Scanning

- Programmed Scan (with 3 scan edges) and Memory Scan Functions
- Built-In Duplexer
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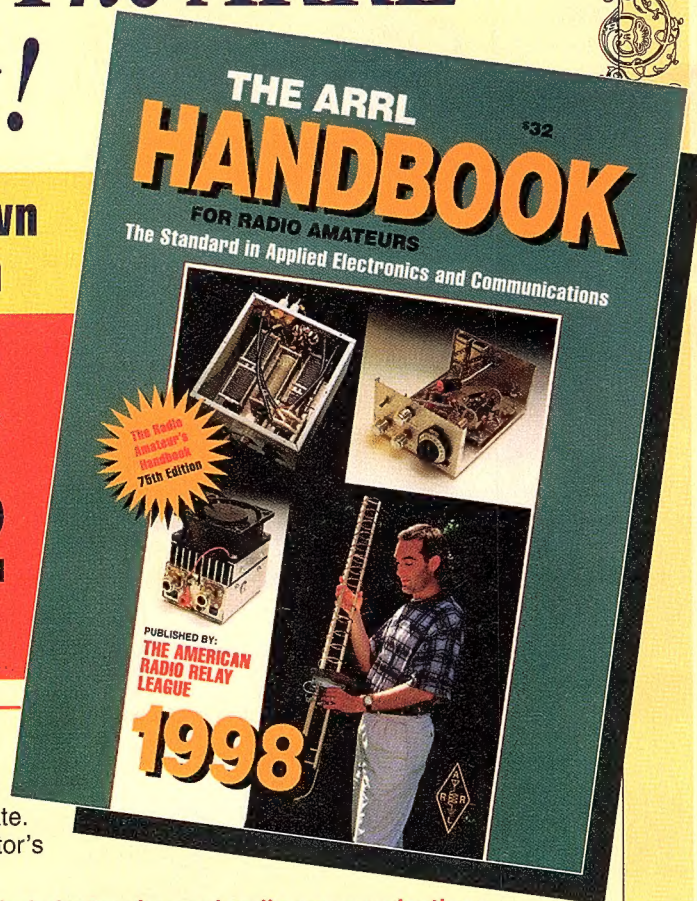
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DSP solution with easy operation.

Kenwood's TS-570D/S HF Transceiver gives you high-end digital performance in an easy-to-use package for any home, mobile or DX-pedition.



TS-570D HF TRANSCEIVER TS-570S HF + 6M TRANSCEIVER

Cruise the upper reaches of elegant HF performance in a compact, affordable transceiver incorporating advanced **AF-stage DSP** for crystal-clear TX and RX audio, digital filtering for sophisticated signal isolation and extraction, **Central Frequency Control System** for high stability, and a full range of enhanced operator features.

The DSP filters and extracts signals utilizing computer algorithms that would be impossible to match with standard analog circuits. The DSP also provides **CD-class transmit and receive audio quality** that can be shaped at will, and two powerful noise reduction systems: **Line Enhancer Method** for SSB/AM modes, and **Speech Processing by Auto Correlation (SPAC)** for CW mode. DSP also enables the **CW-Auto Tune** feature that automatically zero-beats CW signals.

The **Extensive Memory Functions** provide a bank of 100 memory positions split into 90 standard channels for general operation and 10 for programmable VFO, programmable scan and long-term memory. You can scroll memory contents, copy from one memory to another, and lock out specific memory channels. In addition there are **5 quick memories** for storing frequencies and

modes on the fly, perfect for the busy DX contester.

The new easy-to-use **Menu System** incorporates **46 menu features** plus an **on-line guide** so you'll never have to drag your owner's manual around again. The **large amber backlit LCD display** provides 4 light levels for clear, concise operational information display under any lighting conditions.

The TS-570D/S exhibits no compromises when it comes to construction and performance. The **continuous-duty 100 watt transmitter** features a large heavy-duty heat sink with integrated cooling fan for non-stop operation even in extreme environmental conditions. The **wide-band receiver** delivers stable coverage from 500 kHz through 30 MHz with dual **pre-amps** and **dual bandpass filters** for exceptional selectivity and sensitivity.

With the features and performance of a high-end radio integrated into an affordable mobile-size package, the TS-570D/S is the perfect choice for the field or to build a full station around at home.

• **Channel scan, program band scan, memory scan with channel lock-out and group channel scan, all with TO (time operated) or CO (carrier operated) resume modes**

- Compact 10 5/8 inch by 3 3/4 inch front panel size for any mobile installation
- Preset auto antenna tuner with 18 sub-bands
- Variable electronic keyer with speed settings between 0 and 100 wpm
- Packet and FSK features
- RCP-2 software for PC-based display and memory configurations
- 57.6 kbps PC control option via 9-pin D-SUB and RS-232C interface
- Memory data transfer between radios (optional IF-232C required)
- Full functionality on 6M (TS-570S) including DSP, 100 watts output and preset Auto Antenna Tuner
- CW message memories
- 10-key direct frequency entry
- Optional VS-3 voice synthesizer
- Optional DRU-3A digital recording unit



ISO 9001
JQA-1205

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97ARD-1679

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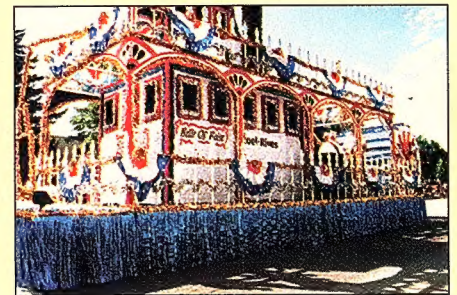
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Our Cover

Has ARRL Headquarters station W1AW moved to a new location? On a frosty, magical Christmas night, anything can happen! Don't be surprised if you hear a little "polar flutter" on our signals, or possibly the faint jingle of silver bells. Best wishes for a happy Holiday Season from everyone at QST!

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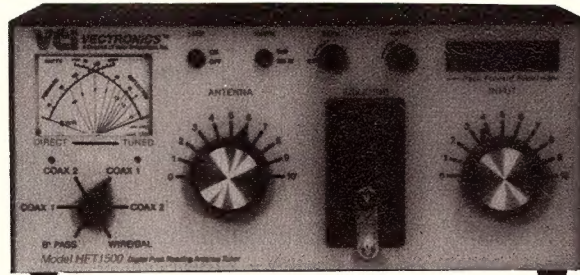
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THE VECTRONICS HFT-1500 ... THE FINEST HIGH POWER ANTENNA TUNER MADE!

- high current Roller Inductor
- SSB*Analyzer Bargraph™
- Cross-Needle Meter
- 6 position Antenna Switch
- built-in 4:1 Balun
- gear driven Turns Counter

HFT-1500
\$459⁹⁵



The VECTRONICS HFT-1500 is not just an antenna tuner ... it's a beautifully crafted work of art, using the finest components available and the highest quality construction.

Every HFT-1500 aluminum cabinet is carefully crafted with a durable baked-on paint that won't scratch or chip.

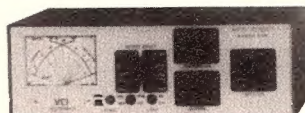
The attractive two-color Lexan front panel is scratch-proof. Take a quarter. Scratch the HFT-1500 front panel as much as you want. You won't leave a mark!

Arc-Free Operation

Two heavy duty 4.5 kV transmitting variable capacitors and a massive high current roller inductor gives you arc-free operation up to 2 kW PEP SSB.

300 Watt Antenna Tuner

VC-300DLP
\$159⁹⁵



VECTRONICS uses the finest components available to build the highest quality 300 Watt antenna tuner ever made.

You can tune any antenna 1.8-30 MHz. Custom 48 position switched inductor and continuous rotation 1000 Volt capacitors provide arc-free operation. Handles 300 Watts PEP SSB, (150 Watts on 1.8 MHz).

8 position antenna switch, built-in 50 ohm dummy load, peak reading backlit cross-needle SWR Power meter, 4:1 balun for balanced line antenna. Scratch-proof Lexan front panel. 10.2x9.4x3.5 in. Weighs 3.4 lbs.

1500 Watt dry Dummy Load



DL-650M, \$64.95. Handles 100 watts continuous, 1500 Watts for 10 seconds to 650 MHz. Ceramic resistor. SWR < 1.3. SO-239 connector. **DL-650MN, \$69.95** has N connector.

Precision Resetability
A sturdy hand cranked roller inductor lets you quickly fly from band to band. A precision 5-digit gear driven turns counter lets you accurately return to your previous settings.

Large comfortable knobs and smooth vernier drives on the variable capacitors make tuning precise and easy. Bright red pointers on logging scales make accurate resetability a breeze.

Absolute Minimum SWR

You can tune your SWR down to absolute minimum!

Why? Because all three matching network components, the roller inductor and both variable capacitors, are fully adjustable.

Tune any Antenna

You can tune any real antenna from 1.8 to 30 MHz, including all MARS and WARC

300 Watt Mobile Tuner

VC-300M
\$109⁹⁵



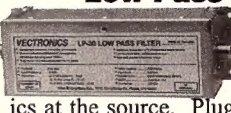
The VC-300M Mobile Antenna Tuner is compact, lightweight, easy-to-operate and is our most economical tuner.

It's compatible with any mobile antenna and any mobile HF transceiver and is compact enough to fit in the most compact car.

It can also be used at home with dipoles, vees, verticals, beams or quads fed by coax.

Backlit dual movement meter simultaneously monitors Power and SWR. Covers 1.8-30 MHz. Handles 300 Watts SSB PEP, 200 Watts continuous, (150 Watts on 1.8 MHz.). 7.25x8.75x3.6 in. Weighs 3.4 lbs.

Low Pass TVI Filter



LP-30, \$69.95. Eliminates TVI by attenuating harmonics at the source. Plugs between transmitter and antenna or tuner. Handles 1500 watts.

bands. You can tune verticals, dipoles, inverted vees, yagis, quads, long-wires, whips, G5RVs, etc ...

SSB*Analyzer Bargraph™
VECTRONICS' exclusive 21 segment bargraph display lets you visually follow your instantaneous voice peaks. Has level and delay controls.

Accurate SWR/Power Meter

A shielded directional coupler and backlit Cross-Needle meter displays accurate SWR, forward and reflected power simultaneously. Reads both peak and average power on 300/3000 Watt scales.

6 Position Ceramic Antenna Switch
Select two coax fed antennas (tuned or bypassed), balanced line/wire or bypass.

Built-in Balun

A 4:1 Ruthroff voltage balun feeds dual high voltage Delrin terminal posts for balanced lines. HFT-1500 is 5.5x12.5x12 inches.

Try any product for 30 days

Call toll-free 800-363-2922 and order any product from VECTRONICS. Try it for 30 days. If you're not completely satisfied return it for a full refund, less shipping and handling -- no hassles. All VECTRONICS products come with a one year warranty.

SWR/Power Meters



PM-30
\$79⁹⁵
PM-30UV
\$89⁹⁵



PM-30, \$79.95, for 1.8 to 60 MHz. Displays forward and reflected power and SWR simultaneously on dual movement Cross-Needle Meter. True shielded directional coupler assures accuracy. Backlit meter displays peak or average power in 300/3000 Watt ranges. First-rate construction includes scratch-proof case/front panel. 5.3x5.75x3.5 inches. SO-239 connectors. **For 144/220/440 MHz, 30/300 Watt ranges.** PM-30UV, \$89.95, has SO-239 connectors. PM-30UVN, \$89.95, has N connectors. PM-30UVB, \$89.95, has BNC connectors.

High Pass TVI Filter



HPF-2, \$24.95. Installs between VCR/TV and cable TV or antenna lead-in cable. Eliminates or reduces interference caused by nearby HF transmitters.

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RTTY • 2M (20 W) SSB/CW/FM/RTTY • Detachable Control Panel/Display* • SSB/CW/AM Narrow Filter Options • 101 Alphanumeric Memories • General Coverage Rx • Noise Blanker • IF Shift • Preamp Attenuator • CW Keyer • CW Pitch Control • Full Break-in (QSK) • Speech Processor • VOX • LCD Display with 1 Hz Readout • Easy-to-use Menu System • Tone Encode Built-In • 2 Antenna Connectors • 6.6"(W), 2.3"(H), 7.9"(D), 5.5 lb

IC-775DSP

Pull Out Those Weak Signals • IF-DSP (Digital Signal Processing) on Tx and Rx • 200 W Stable Output Power • SSB/AM/FM/XCW/RTTY • Built-In Heavy Duty Power Supply • Built-In Auto Antenna Tuner • DSP Notch Filter • Adjustable DSP Noise Reduction • Level/Width Variable Noise Blanker • PSN Modulation • 16.7"(W), 5.9"(H), 15.4"(D), 36.8 lb



IC-756

Great
Audio

HF+6M • TRUE Dual Watch • 4.9" Concentrated Information LCD Dot Matrix Display with Spectrum Scope, Alphanumeric Memories and Soft Key Buttons • 100 W Stable Output Power (40 W AM) • SSB/AM FM/CW/RTTY • Built-In Automatic Antenna Tuner • 101 Memory Channels • Automatic Audio Notch Filter • Twin PBT • 13.4"(W), 4.4"(H), 11.2"(D), 23.1 lb

IF-DSP



IC-821H

2M/440 MHz Advanced Satellite/Digital Base Station • All Mode • Easy to Use • Continuous Adjustable Transmit Power • Sub Band Transmit • 9600 Full Compatibility Out of the Box • 160 Memories • Noise Blanker & IF-Shift on Main & Sub bands (independent main/sub Rx) • Built-In Electronic Keyer • Compact! 9.5"(W), 3.7"(H), 9.4"(D), 11.0 lb



HANDHELDS

IC-T22A/IC-T42A

2M/440 MHz Single Band • Fun, Shirt Pocket Small & Easy to Use • Large Alphanumeric Display • Wide Rx Coverage • 5 W @ 13.5 V (3 W Out of the Box) • Air Band Rx • 80 Memory Channels (40 w/ Alpha Display) • 2.3"(W), 4.3"(H), 1.1"(D), 10.9 oz



IC-W32A

2 M/440 MHz Dual Band • 5 Watts Out of the Box • No Function Key • 200 Memories with Alphanumeric Display, Messaging & Paging • "Intuitive" Help Display • Backlit Display & Keypad • Wide Band Rx (Including Air Band) • V/V, V/U, U/U Operation with VHF/UHF Tuning Knob Exchange • Encode/Decode • 2.2"(W), 4.9"(H), 1.2"(D), 12 oz



IC-T7A HP

2M/440 MHz Dual Band • Dual Bander at a Single Bander Size & Price • Easy to Use! No Function Key • MORE POWER! 5 W (2M)/4 W (440 MHz) Out of the Box • "Intuitive" Help Display • CTCSS Encode/Decode • 2.5"(W), 4.8"(H), 1.1"(D), 11.3 oz



Ni-Cd or Alkaline
Powered

X-tra
Rugged

IC-T2A

2 Meter Single Bander • PC Programmable* • Built-In CTCSS Encode/Decode with Pocket Beep & Tone Scan • Rugged Aluminum Chassis • 8 Programmable Key • 43 Memory Channels • Uses Ni-Cd or Alkaline Power (8 Ni-Cd "AA" included) • 4.5 Watts of Power • 2.3"(W) 5.5"(H), 1.3"(D), 10.9 oz



MOBILES

IC-2000H

2M Intermod Fighter • Wide Band Rx (118-174 MHz) • Highly Intermod Resistant • 50 Watts of Power • 50 Memory Channels with Alphanumeric Display • AM Aircraft Rx • 5.9"(W), 2.0"(H), 5.9"(D), 2.4 lb



IC-2710H



2M/440 MHz Dual Band Mobile • 2M (50 Watts)/440 MHz (35 W) • Detachable Control Panel* • Fast Scanning • 220 Memory Channels • PC Programmable • CTCSS Encode (decode opt.) • RF Attenuator • 8 DTMF Memory Switches • V/V, U/U Simultaneous Rx • Built-In Duplexer • 5.5"(W), 1.6"(H), 8.4"(D), 3.1 lb

WOW

IC-207H

2M/440 MHz Dual Band Mobile • 2M (45 W)/440 MHz (35 W) • Super-Compact Detachable Control Panel* with Big Keys, Big Knobs and Big Display • One-Touch Switch Between Bands • 9600 Baud Ready • 182 Memory Channels • CTCSS Encode/Decode • Faceplate: 4.4"(W), 1.6"(H), 1.1"(D)



RECEIVERS

IC-R10

Advanced, Yet Easy to Use Handheld • Wide Band Coverage — .5 - 1300 MHz† • All Mode: FM, WFM, AM, USB, LSB, CW • "Real Time" Band Scope • New "Signal Navigation" (SIGNAVI) Scan • 1000 Memory Channels



IC-R8500

Next Generation HF/VHF/UHF World Receiver • Wide Frequency Range: 100 kHz - 2000 MHz† • All Mode • Superior Receive Characteristics • Built-In CI-V and RS-232C Hardware for Advanced Computer Control • IF-Shift • Audio Peak Filter (APF) • Noise Blanker (SSB/AM) • RF Attenuator • 1000 Channels • 2 Antenna Connectors



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ICOM

10, 15, 20 Meters
9 Elements on a 28 ft (8.6m) Boom
Optional 2 Element 40 Meter Kit

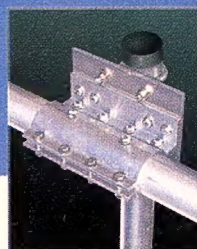
BIG THUNDER SERIES

X9

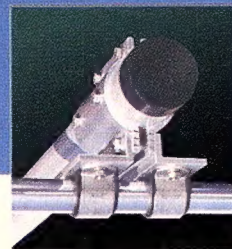


X7

Boom to Mast Clamp



Element to Boom Mounting



The Performance Tribander for the DX Years Just Ahead

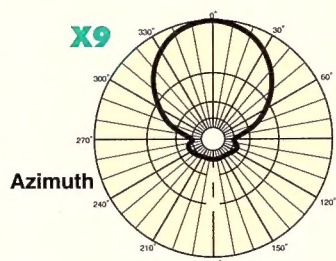
- ▶ New High Efficiency Computer Optimized Design for Maximum Gain and Ultra Clean Radiating Pattern
- ▶ 100+ MPH Construction for Best Reliability and Long Life
- ▶ NEW 4L Log Cell Driven Elements for better VSWR Bandwidth
- ▶ Trapless Driven Elements and Reflectors for Reliable Power Handling
- ▶ Interleaved Element Design for Mono-Band Performance
- ▶ Add-on kits available for 40 Meters

The new X9 and X7 Triband Yagis are geared to set new standards in both radiating performance and mechanical reliability. Cushcraft's product development team has employed the latest computer modeling technology to achieve a superior electrical design as well as elegant new mechanical hardware and assembly techniques.

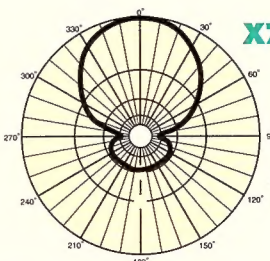
Each mechanical component was designed to 100+ MPH wind survival

with a 1.25 safety factor. Traps were eliminated from the high current driven elements and reflectors using the new 4L Log Cell design, which yields virtual monoband performance and maximum power handling capability. Traps are employed only in the lower current directors for increased gain and sharper pattern. The result is a truly high performance antenna family which will easily handle the legal limit.

X9

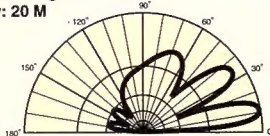
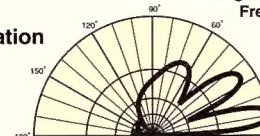


X7



Typical radiation patterns.
Height: One wavelength.
Frequency: 20 M

Elevation



SPECIFICATIONS	X9	X7
Frequency Coverage (Meters)	10, 15, 20	10, 15, 20
Total number of Elements	9	7
Number of Elements per Band	4	3
VSWR Minimum	1.1:1	1.1:1
VSWR 1.5:1 Bandwidth (KHz)	20M 350	600
	15M 450	750
	10M 1500	1700
Longest Element, ft (m)	36.5 (11.12)	37.2 (11.33)
Turning Radius, ft (m)	21.7 (6.61)	20.0 (6.09)
Boom Length, ft (m)	28 (8.53)	18 (5.49)
Boom Diameter, in (cm)	2-1/2 (6.35)	2-1/2 (6.35)
Maximum Mast Diameter OD, in (cm)	2-1/2 (6.35)	2-1/2 (6.35)
Maximum Wind Survival, mph (kph)	>100 (>161)	>100 (>161)
Maximum Wind Surface Area, ft ² (m ²)	9.9 (.92)	7.9 (.73)
Windload @ 80 mph, lb (kg)	255 (116)	202 (92)
Maximum Power Handling (KW)	2	2
Weight, lb. (kg)	85 (38.5)	60 (27.2)
List Price	\$995	\$675



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THE AMERICAN RADIO RELAY LEAGUE INC



The American Radio Relay League Inc is a noncommercial association of radio amateurs, organized for the promotion of interest in Amateur Radio communication and experimentation, for the establishment of networks to provide communication in the event of disasters or other emergencies, for the advancement of the radio art and of the public welfare, for the representation of the radio amateur in legislative matters, and for the maintenance of fraternalism and a high standard of conduct.

ARRL is an incorporated association without capital stock chartered under the laws of the State of Connecticut, and is an exempt organization under Section 501(c)(3) of the Internal Revenue Code of 1986. Its affairs are governed by a Board of Directors, whose voting Members are elected every two years by the general membership. The officers are elected or appointed by the Directors. The League is noncommercial, and no one who could gain financially from the shaping of its affairs is eligible for membership on its Board.

"Of, by, and for the radio amateur," the ARRL numbers within its ranks the vast majority of active amateurs in the nation and has a proud history of achievement as the standard-bearer in amateur affairs.

A *bona fide* interest in Amateur Radio is the only essential qualification of membership; an Amateur Radio license is not a prerequisite, although full voting membership is granted only to licensed amateurs in the US.

Membership inquiries and general correspondence should be addressed to the administrative headquarters; see page 10 for detailed contact information.

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"It Seems to Us..."

Are We Our Own Worst Enemy?

*"We has met the enemy, and it is us."—
Walt Kelly (Pogo)*

Members' contributions in response to the Defense Fund solicitation mentioned here last month are pouring in. Your support of the League's efforts to protect our international frequency allocations is both gratifying and humbling; thank you!

Some of the responses come with words of encouragement attached, which mean a lot to us. A few notes follow a somewhat different theme, and there are enough of them that it's worth a moment this month to talk about that theme.

These notes go something like this: "It's fine to talk about defending our frequency allocations at international conferences, but don't you guys ever listen to what's happening on the bands? Our problems are a lot closer to home: nets that are a haven for hate-filled rhetoric, frustrated talk-show hosts, deliberate interference, and every manner of indecency and obscenity. It's bad enough to have to put up with that garbage, but if anyone ever brought a recording of it to an international conference we'd be dead. You'd better do something about it!"

Unfortunately, there's some truth to this. Such problems generally are confined to a few notorious frequencies in a couple of phone bands, but they are visible to an extent that is all out of proportion to the small number of participants.

Such problems also are nothing new. Amateur Radio is not isolated from society as a whole; it never was, and never will be. Technical and operational examinations cannot weed out those who may be prone to antisocial behavior. A letter in June 1935 *QST* complains of on-the-air conduct such as "a fellow thickly describing a drunken party at his home" and the general level of "mumbling immature chitchat," and ends with this warning: "To continue it means certain loss of the remaining privileges and unless 'phone operation improves there is no chance for us to induce the 'powers that be' that we ought to have more rights or fewer restrictions." More recently, the "crisis" of malicious interference was a recurring theme of *QST* editorials in 1980. A lot more examples can be found before, after, and in between. To claim that in 1997 we're suddenly going to hell in a handbasket is clearly an overstatement of the situation.

Even so, it would be irresponsible simply to shrug and say, "The lunatic fringe will always be with us." The ones who step over the line into illegality deserve citations,

finer, or the loss of their licenses, depending on the severity and frequency of the violations. For years we've called for more enforcement action by the FCC, and just six months ago devoted much of this page to an ARRL proposal to improve the Commission's handling of private-sector complaints of malicious interference.

What can we do? Starting with the simplest thing, the League's volunteer Official Observers who function as the Amateur Auxiliary to the FCC's Compliance and Information Bureau deserve a kind word now and then from those of us whose interests they are laboring to protect. If we treat these volunteers, who have neither the responsibility nor the authority to take enforcement actions themselves, as scapegoats for other failures in the system, then we become part of the problem.

More difficult are the fringe operators who are clever enough to stay legal, or at least to stay in the grey area where enforcement action is unlikely. Some of them delight in baiting other amateurs into retaliating with acts that are clearly illegal, and that only make matters worse. All this accomplishes is to reward the provocateurs with the attention they crave while turning the frequency into even more of a social cesspool; if we fall for that, we become our own worst enemy. If you can't listen to provocative stuff without responding in kind or worse, then don't listen. There are lots of other frequencies and modes on which to pursue your healthier interests.

For that matter, why listen to it in the first place? It is vital that we not let the bad drive out the good. If the good guys spend all of their radio time monitoring the fruitcakes, then the latter will be the only ones represented on the bands and we can hardly blame a casual listener for thinking we're all like that. Get on the air yourself, elsewhere in the band, and set a positive example for others.

For decades we have contemplated the nightmare scenario of being held hostage at international conferences to recordings of misbehavior in the amateur bands. Other services, including broadcasting, have a similar problem. If attacked in that fashion, we would argue that what was being presented was taken out of context and did not represent the overwhelming majority of Amateur Radio communication, as would the broadcasters on their own behalf. Help the Amateur Service by contributing, through your own operating, to that positive context.—David Sumner, K1ZZ

We're At Your Service

ARRL Headquarters is open from 8 AM to 5 PM Eastern Time, Monday through Friday, except holidays. Our address is: 225 Main St, Newington, CT 06111-1494. You can call us at 860-594-0200, or fax us at 860-594-0259.

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If all else fails, send e-mail to hq@arrl.org and it will be routed to the right people or departments.

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Service	ARRL Address
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America Online	HQARRL1

Downloadable files for the new ham, upgrader, instructor or disabled ham are featured in the various on-line ham radio file libraries.

ARRL BBS

The ARRL Hiram Bulletin Board System is as close as your telephone. Hiram offers more than a thousand software files for your enjoyment. You can also use Hiram to send

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Technical Information Server

If you have Internet e-mail capability, you can tap into the ARRL Technical Information Server, otherwise known as the *Info Server*. To have user instructions and a handy index sent to you automatically, simply address an e-mail message to: info@arrl.org
Subject: **Info Request**
In the body of your message enter:

HELP
SEND INDEX
QUIT

ARRL on the World Wide Web

You'll also find the ARRL on the World Wide Web at:

<http://www.arrl.org/>

At the ARRL Web page you'll find the latest W1AW bulletins, a hamfest calendar, exam schedules, an on-line ARRL Publications Catalog and much more. We're always adding new features to our Web page, so check it often!

Stopping by for a visit?

We offer tours of Headquarters and W1AW at 9, 10 and 11 AM, and at 1, 2 and 3 PM, Monday to Friday (except holidays). Special tour times may be arranged in advance. Bring your license and you can operate W1AW anytime between 1 and 4 PM!

ARRL Headquarters is within easy driving distance from Interstates 84 or 91. In addition, Hartford is served by Amtrak, with several trains daily from

New York, Boston and beyond (call 1-800-USA-RAIL for more information). Bradley International Airport in Windsor Locks, Connecticut (about 20 miles north of Headquarters), is served by many major carriers.

Would you like to write for QST?

We're always looking for new material of interest to hams. Send a self-addressed, stamped envelope (55¢ postage) and ask for a copy of the *Author's Guide*. (It's also available via the ARRL Info Server, and via the World Wide Web at <http://www.arrl.org/qst/aguide/>.) The guide contains all the information you'll need to craft an article to meet our requirements. Send article ideas or manuscripts to the attention of the QST Editor (e-mail qst@arrl.org).

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Power to work repeaters many miles away.
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Alinco DJ-C4T 70 cm (440 Mhz) Mini HT

- 420 ~ 449.995 MHz transmit range



The Alinco DJ-C1T and DJ-C4T represent breakthroughs in mini-radio technology. About the size of a credit card, one can be carried in pocket or purse. With it, you're ready to communicate anytime. Whether you're in business attire or running a marathon, these small, lightweight radios are easy to carry and easier to operate. You'll be amazed at the clean, crisp audio. The lithium ion battery is a revolution in power technology, going as long as 100 hours between

Accessories Available

- EDS-7 Adaptor Cable for use with speaker mics and headsets
- EDC-36 Mobile charger
- EMS-9Z speaker mic (requires EDS-7)
- EMS-41 speaker mic (requires EDS-7)

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Simple ■ Clean ■ Dependable



ALINCO

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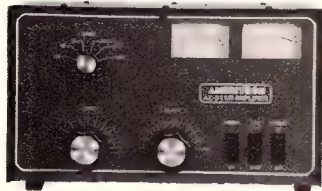
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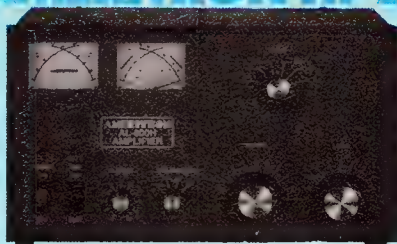


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input circuit, grid protection, ALC control that is front panel adjustable, vernier reduction drives, heavy duty 32 pound grain oriented silicone steel core transformers and high capacitance computer grade filter capacitors.

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\$1595
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1250 Watts

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Suggested Retail

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Ameritron's toughest legal limit Amp

AL-1200 with Eimac® 3CX1200A7 tube
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Get ham radio's toughest tube with the Ameritron AL-1200 -- the Eimac 3CX1200A7. It has a 50 watt control grid dissipation. What makes the Ameritron AL-1200 stand out from other legal limit amplifiers? The answer: A super heavy duty power supply that loafs at full legal power -- it can deliver the power of more than 2500 watts PEP two tone output for a half hour.

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Suggested Retail

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AMERITRON no tune Solid State Amplifiers

Ameritron ALS-500M Mobile no tune Solid State Amp has 500W out, covers 1.5-22 MHz



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13.8 Vdc mobile electrical system, very compact 3 1/2 x 9 x 15 in., extremely quiet, 500W output, 1.5-22 MHz coverage, instant bandswitching, no tuning, no warm up, no tubes, SWR protected.

Ameritron ALS-600 no tune Solid State FET amp includes heavy duty power supply, 600 Watts out



ALS-600
\$1299
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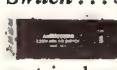
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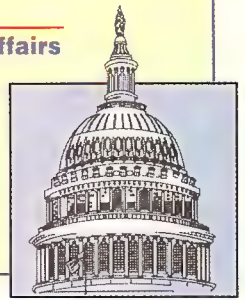
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DC Currents

By Steve Mansfield, N1MZA

Manager, Legislative and Public Affairs

Just as radio waves aren't constrained by artificial boundaries, neither is ARRL's government relations effort. "DC Currents" covers behind-the-scenes activity you need to know about in Congress, at the FCC and other regulatory agencies, as well as at worldwide bodies such as the International Telecommunication Union.



Tauzin Says "We Hear You" To Amateurs, Scanner Fans

◆ HR 2369, the Wireless Privacy Enhancement Act, has been rewritten to reflect the concerns of Amateur Radio operators, volunteer firefighters, scanner enthusiasts and others. The ARRL worked with a coalition of other organizations to make sure your voice was heard on The Hill.

The bill was fixed in House Telecommunications Subcommittee markup October 29. In an opening statement, Chairman W.J. "Billy" Tauzin said he had intended "to protect users of wireless services that pay for such services ..." (i.e. cellular and PCS). But the original bill went well beyond protecting those services and, at least arguably, could have outlawed some traditional scanning activities, as well as affecting amateur out-of-band equipment. ARRL and others objected. Many meetings, phone calls and letters with Tauzin's staff followed the introduction of the original bill. The fruits of our efforts were revealed at markup when a better substitute bill was introduced restricting the scanner ban to cellular and PCS frequencies.

Mr. Tauzin noted our concerns. "The bill was never intended to prohibit the scanning of public safety frequencies or other noncommercial frequencies in which users have no expectation of privacy," he said.

"I have worked closely with the public safety community, amateur radio operators, and scanner manufacturers...many of their concerns raise legitimate, socially beneficial goals...I thank their representatives for working so constructively with this Committee in order to articulate the goals of enhancing the security of private communications without threatening legitimate users of scanners."

One of the bill's original cosponsors, Rep. Anna Eshoo (D-CA-14th) praised Mr. Tauzin for listening to Amateur Radio concerns. So did Rep. Ron Klink (D-PA-4th), while noting that the bill's requirement that FCC investigate and act upon complaints about privacy violations could be a problem, given FCC's enforcement track record. Klink said he worried about adding to the Commission's workload without providing further resources.

The next step for the bill will be the full Commerce Committee. ARRL will continue to work with committee staff to fine-tune one of the bill's provisions that could have unintended consequences with regard to unrelated modifications of equipment.

On the whole, it looks like Congress has listened. It is still too early to say whether the bill in its modified form, or in any other form, will ever become law.

Amateur Radio Gets TV, Radio News Coverage

◆ A key ARRL objective is to ensure that Amateur Radio gets plenty of positive news media coverage. So, in addition to working with national media on story development, we also prepare regular information packets for our PIC/PIO network to use with local news media. Does it work? Consider: every month ARRL receives dozens of stories about Amateur Radio that our clipping service culls from newspapers in the US with circulation over 10,000. We also receive many more clippings that members find in their local papers and mail to us. Is ARRL responsible for this outstanding coverage? We'd like to think we play some part in it. But we're the first to admit that the real origin of these stories is the continuing fascination Amateur Radio itself holds for ordinary people with an interest in technology. Of course, there is also the willingness of amateurs around the country to share their enthusiasm with the news media. The work hard, and it shows!

Recently, we began to wonder if the electronic media was paying as much attention as newspapers. We asked a video monitoring service to prepare a report of more-than-incidental mentions they could find for a period of six weeks beginning September 1. Here's what they found:

- Discovery Channel "Beyond 2000": piece on Amateur Radio, Sept. 8;
- WUSA-TV (CBS, Washington): coverage of Gaithersburg, MD hamfest, Sept. 8;
- CNN "Showbiz Today": Amateur Radio traffic handling behind the scenes at the Miss America Pageant, Sept. 12;
- CNN "Headline News": repeat of Miss America segment, Sept. 12;
- KTVT-TV (CBS, Dallas): neighbors upset about ham antenna, Sept. 12;
- KNWS-TV (Ind, Houston): picks up CNN Miss America story, Sept. 12;
- WABC-TV (ABC, New York City): local Amateur Radio club meets with Mayor Giuliani to celebrate Amateur Radio Day, Sept. 19;
- KABC-TV (ABC, Los Angeles): Amateur Radio operators involved in volunteer Fire Watch project, Sept. 19;
- KPHO-TV (CBS, Phoenix): Amateur Radio setup for kids at the Arizona Science Center, Sept. 25;

- WESH-TV (NBC, Orlando): Shriners ham radio swap meet, W3UNM talks about use of ham radio, Oct. 4;
- KFVB-AM Radio (Ind. Los Angeles): Amateur Operator communication involved in Hurricane Pauline recovery activities in Mexico, Oct. 9;
- KNX-AM Radio (CBS, Los Angeles): Amateur Operator communication involved in Hurricane Pauline recovery activities in Mexico, Oct. 9;
- KNSD-TV (NBC, San Diego): Amateur Operator communication involved in Hurricane Pauline recovery activities in Mexico, Oct. 9;

For the month of September, we received 51 clips from daily newspapers (above 10,000 circulation) on Amateur Radio and 10 from weekly papers. So when somebody tells you "Amateur Radio never gets any news coverage," don't you believe it! What thread do these stories have in common? Not one is about "ham radio" in general. Rather, they're always about ham radio *doing* something interesting. So get busy. And then tell your local reporter about it!

New FCC Commissioners Headed for Senate Confirmation

- The White House Nominees for the revamped Federal Communications Commission had their "day in court" in October when the Senate Commerce Committee held hearings to determine their suitability. As you read this, it is likely that the Senate will have confirmed all of the candidates. They include William E. Kennard, Harold W. Furchtgott-Roth, Michael Powell, and Gloria Tristani. Susan Ness, whose appointment expires in 1999 is the sole holdover. FCC Commissioners serve 5 year terms. Senators Jesse Helms (R-NC), John Ashcroft (R-MO) and Ted Stevens (R-AK) had made rumblings about blocking Kennard's appointment, and Senator Kay Bailey Hutchinson (R-TX) had expressed reservations about Tristani. But all three Senators eventually gave the nominations their blessing.

1997 Session Ends with Whimpers and Bangs in Washington

• As we went to press, the sound and fury in Washington was winding down for the season. Members of Congress packed their bags to head home until January, and FCC appointees waited in the wings eager to try out their brand new chairs. Congress will return to a full slate of legislation placed on the table in 1997. More than 3500 measures were introduced in the House of Representatives and 2700 in the Senate. But so far, the going has been slow. Congress has enacted

and the President has signed just 49 pieces of new legislation, so 1998 is apt to be hectic.

During 1997, Congress tackled the largest, most time consuming issues, including appropriations and authorization bills, the balanced budget, and campaign finance reform. Telecommunications issues have not been on the front burner. But, the House Telecommunications Subcommittee and the Senate Communications Subcommittee have

had hearings on cellular telephone privacy, spectrum management policy, the WTO telecommunications agreement, NTIA reauthorization and television rating guidelines. There are plenty of telecommunication bills "in the hopper" should the committees decide to turn their attention to these issues. In 1997, ARRL visited about 200 Congressional offices in addition to monitoring hearings, markups and other special Congressional events.

Telecommunications Bills, 105th Congress, First Session

♦ Here is a summary of significant telecommunications legislation introduced during the first half of the 105th Congress. We have removed from the list bills with only incidental references to telecommunications issues. To get a current status report on any of these bills, go to <http://thomas.loc.gov> on the World Wide Web.

House of Representatives

HR 84 To require broadcasters to provide free time for political advertising.

HR 121 To repeal statutory authority for Corporation for Public Broadcasting.

HR 147 To direct FCC to establish ethnic and minority affairs section.

HR 280 To require FCC to implement recommendations on universal service support (advanced telecommunications) for schools and libraries.

HR 369 To require FCC to prescribe rules to protect public safety by preventing broadcasts that create hazards for motorists.

HR 486 To promote greater telecommunications and information services to Native Americans.

HR 555 Variation on HR 486.

HR 695 To relax export controls on encryption technology and prohibit mandatory key escrow.

HR 910 To require violent TV programs be broadcast after hours when children comprise substantial portion of audience, unless rated on violent content so as to be blockable by electronic means.

HR 1013 To put Amateur Radio VEs and OOs under the protection of the Federal Tort Claims Act.

HR 1017 To require FCC to establish toll free telephone number and computer site for collection of complaints.

HR 1054 To establish national policy against state and local interference with interstate commerce on the Internet.

HR 1067 To prohibit the advertising of distilled spirits on radio and television.

HR 1180 To require Internet providers to provide screening software that permits parents to control Internet access.

HR 1287 To regulate use by interactive computer services of Social Security numbers and related personal information.

HR 1324 To clarify authority of FCC to authorize foreign investment in US broadcast and common carrier licenses.

HR 1367 To prohibit Federal agencies from making available through the Internet certain confidential records with respect to individuals.

HR 1539 To require the FCC to preserve low-power television stations that provide community broadcasting.

HR 1626 To require the licensing of unused channels in the 152-159 and 470-512 MHz bands for public safety uses.

HR 1964 To increase scope of prohibitions against cellular and other "scanner eavesdropping." See HR 2369 for another version of bill (see, also, September 1997 "DC Currents").

HR 2369 Enlarges prohibitions against cellular eavesdropping to include listening to CMRS frequencies, and proposes stiffer penalties for listening to or disclosing the contents of certain transmissions (see October and November 1997 "DC Currents").

HR 2383, To authorize enforcement by state and local governments of certain FCC regulations regarding use of citizen band radio equipment.

HR 2400 To provide funding for highways and other surface transpor-

tation, and includes provision for designating spectrum for "Intelligent Transportation System," most likely in the 5 GHz range.

H RES 29 To express intentions of House of Representatives concerning the universal service provisions of Telecommunications Act of 1996 as they relate to telecommunications services to Native Americans.

Senate

S 11 To reform Federal election campaign (including broadcast campaign advertising).

S 12 To improve education for 21st Century (development of technology skills).

S 59 To terminate Extremely Low Frequency Communication System of Navy.

S 95 To provide for Federal campaign finance reform, (including broadcast campaign advertising).

S 213 To repeal amendments on obscene and harassing use of telecommunications facilities made by Communications Decency Act of 1996 and to restore provisions in effect before the enactment of the act.

S 255 To provide for the reallocation and auction of portion of electromagnetic spectrum (from TV channels) to enhance law enforcement and public safety telecommunications.

S 363 To limit violent TV broadcasts to hours after which children comprise substantial portion of audience, unless rated on violent content so blockable by electronic means.

S 376 To affirm right to use and sell encryption products and to establish privacy standards for voluntary key recovery encryption systems.

S 377 To promote electronic commerce by facilitating the use of strong encryption.

S 385 To provide reimbursement under the Medicare program for "telehealth" services.

S 407 To clarify authority of FCC to authorize foreign investment in US broadcast and common carrier licenses.

S 493 To amend criminal code to outlaw cellular telephone cloning paraphernalia.

S 608 To authorize enforcement by state and local governments of FCC regulation of illegal citizen band radio equipment.

S 641 To require FCC to eliminate regulations restricting cross-ownership of broadcasting facilities.

S 663 To enhance taxpayer value in auctions conducted by the FCC.

S 665 To monitor the progress of the Telecommunications Act of 1996.

S 705 To establish statutory rules for conversion of TV from analog to digital transmission.

S 741 To enable FCC to enhance spectrum management capabilities through lease fees and to enhance public safety radio.

S 1173 Companion bill to HR 2400, this "Intermodal Surface Transportation Efficiency Act," or ISTEA, contains provisions for radio links for "intelligent highway" system.

S RES 86 Sense of Senate on Internet telephone access charges and growth of advanced interactive communication networks.

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"And with dual receive you can talk on one band, and listen on another!"



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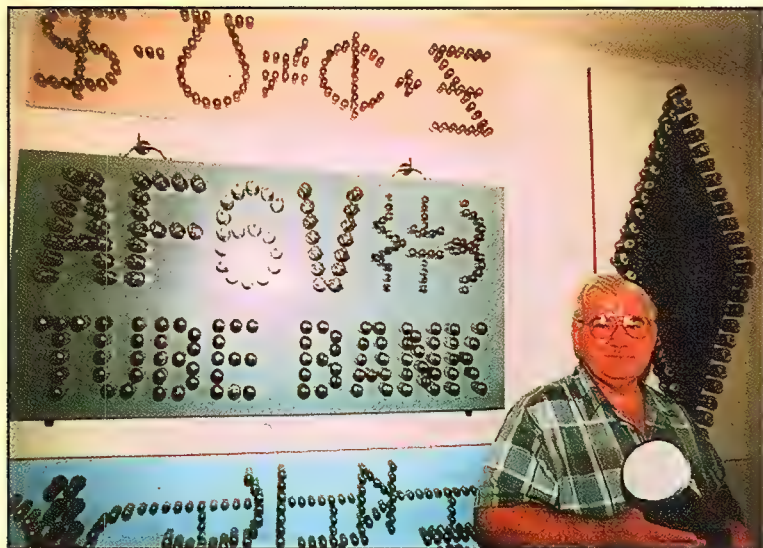
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2m 50/20/5 Watt
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- Time Out Timer (TOT)
- Accessories: Consult your local Yaesu dealer.

*Cellular & 900 MHz Cordless Phone frequencies blocked.





Tubes, tubes, tubes, wonderful tubes! (Any similarity to a Monty Python skit is purely intentional.) Bob Wentworth, AF6V, has about 30,000 working firebottles that he is making available *free* to hams who can use them. You only have to pay \$5 for shipping. Send Bob a self-addressed, stamped envelope and ask if he has the tube you're looking for. His address is: 4804 Huron Ave, San Diego, CA 92117-6211.



Even in Korean, it means the same. Joe Preski, KG6KH, occasionally travels to Ulsan, Korea on assignment for his employer, the Hyundai company. Joe's friend Doc, WE6A, asked if he could deliver a QSL card on his next trip to Ulsan. The recipient was Jin, HL5XF. Joe managed to track down Jin after his arrival and they journeyed together to the local ham outlet. It wasn't difficult to find. Notice the word "ham," in English, on the storefront sign!



Another day, another island. John Reisenauer, NL7TB, is an active QRP enthusiast and tireless promoter of the US Islands Awards program. When the weather is decent—and even when it isn't—you'll find him on the air from *somewhere*—typically an island in the US or Canada. Earlier this year John worked "canoe mobile" from several islands (right). He also operated as VE7USI from remote Caribou Island (above). With enough bug spray, you can go anywhere!

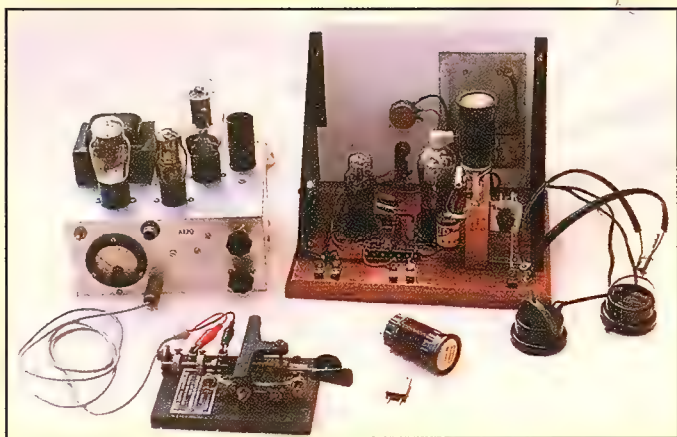




You don't need a stovepipe hat to copy CW, but it helps. Jim Wilson, K4BAV (left), and Roland Anders, K3RA (right), members of the Morse Telegraph Club, step back in time to demonstrate their keying skills, 1840s style, at the B&O Railroad Museum in Baltimore, Maryland.



Ham radio and woodworking combine at John F. Kennedy High School in Granada Hills, California. Check out the impressive cabinet that houses the Kennedy Ham Radio Team's station! Instructor Robert Hazard, N6BNF, reports increasing interest in Amateur Radio among his students. Here Carolina Rodriguez, KF6FNS, makes a contact while Tony Salazar looks on.



Forward into the past! Alex Mendelsohn, AI2Q, wanted to see what it would be like to operate with the type of beginner's rigs that were popular in the 1930s. He decided to build a 30's beginner station from the ground up, searching fleamarkets for parts. The regenerative receiver (right) uses a Type 24 pentode as the detector, followed by a Type 27 triode audio amplifier. The transmitter is based on a crystal-controlled 6L6 Colpitts oscillator. It puts out about 8 W. With this old-time setup, Alex has made plenty of domestic and international contacts.



VICKI ROSENKRANTZ

NARLy, dude! Last June the mayor of Newington, Connecticut honored the Newington Amateur Radio League (NARL) for its outstanding public service activities and proclaimed the last week of the month as "Amateur Radio Week." Gripping and grinning, from left to right are NARL board and committee members Ed O'Reilly, KA1ZOI; Fred Jarvis, N1KWJ; Karl Witter, WB1FNK; Joe Bottiglieri, AA1GW, (ARRL Technical Information Service Coordinator); Al Cohen, W1FXQ (Connecticut Public Information Coordinator); Bob Pratt, KD1LU, who accepted on behalf of NARL; and John Hennessee, N1KB, (ARRL Regulatory Information Specialist) who accepted on behalf of ARRL Headquarters.



MAGGIE BROGDON

Midwest Division Vice Director Bruce Frahm, K0BJ, looks like the cat that just ate the canary. Actually, it's the satisfied grin that appears when you've just purchased a new radio. The sunspots are finally on their way back, and Bruce is ready for winter DX.

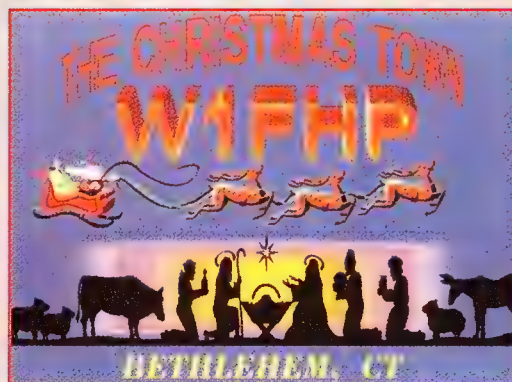


The Night Before Christmas

(The abbreviated version that Clement Clarke Moore *might* have written had he been a QST editor working on a tight deadline.)



'Twas the night before Christmas when all through the house, not a creature was stirring—except for the golden humanoid fish in the family room. Henryk Kotowski, SMØJHF, sent us this concept shot of a golden “fish” from a traditional Russian fable. After being hooked and hauled into the boat, the fish promised to grant three wishes if the fisherman would set her free. The angler must have been a ham because Henryk’s golden fish is offering a CW paddle, a microphone and a digital interface!



QSL cards were hung by the chimney with care ... like this attractive “eyeball” card created by W1FHP in Bethlehem, Connecticut.



... in the hope that St Nicholas would soon be there. If he wasn't already frozen in place, like the frosty caroler on N1CC's QSL!

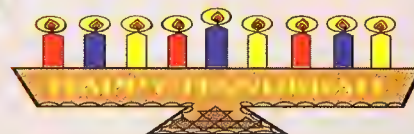


The children were nestled all snug in their beds ... while visions of 4-400As danced in their heads! Could you possibly find a warmer holiday scene than the one that graces K7YHA's Christmas card?



When out on the lawn there arose such a clatter, I sprang from the bed to see what was the matter. It was Santa and his reindeer tangled in the lights hanging from the tower that supports the HyGain TH7-DXX owned by John, WAØDYU. We hope his homeowner's insurance covers injuries to supernatural entities.

But I heard him exclaim, ere he drove out of sight, “Good DX to all! And, to all, a good night!”



(And keep your cameras handy this Holiday Season. Send us your photos and you might see them in next December's QST!)

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- MH-A201:** 2m/70cm 45/35W @ 5W
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- MH-A302:** 2m/70cm 45/35W @ 5W

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NOT "A VISION OF OUR FUTURE"

◆ As a relatively new ham (licensed 3½ years ago), as well as a new member of the ARRL, I felt compelled to respond to the letter from Ron, KA4EET, which appeared in the October "Correspondence."

It would seem that Ron is, in effect, foreseeing the end of the hobby at the hands of the Internet, a point I cannot see, nor accept. His cute story about Jim, a 20-year veteran of the hobby, was going along just fine until he got to the end.

During the conversation Mike mentioned that he was selling off his ham gear. "Our town is wired for high-speed Internet access," he said. "I can talk and exchange video with people anywhere in the world without worrying about propagation."

The gist of Ron's story, it seemed, was that the computer age was ultimately going to be the means to the end of Amateur Radio. Now, let me present another side to this. I must start by saying that the Internet is merely an enhancement to our hobby. Yes, I can use it to communicate with people all over the world, but the Internet doesn't inspire me to abandon my radio. On the contrary, communicating over the same distance via Amateur Radio presents an enjoyable *challenge* that the Internet lacks.

May I suggest, respectfully, that we look at the real reason why Amateur Radio may suffer in the future? Quite simply stated, it is because the older generation is getting tired. I have been told countless times, "We've done our share. Get some of the new guys in on it." This may be good from the standpoint of getting younger hams involved, but we still need the veterans to show us the ropes! We need their ideas for electronic projects, for building antennas and their guidance in learning proper etiquette on the HF bands. In short, we need you Old Timers to do the same things your Elmers taught you back in the good ol' days.

It's not time to hang up your working shoes just yet. If you don't take time to Elmer some of us along, your prophecy of Amateur Radio's end might well come true! However, if this hobby is such a great thing, shouldn't we be willing to talk about its benefits? I realize some do, but the fact is, we *all* need to do it!

No, the computer will not end Amateur Radio, but lack of interest and Elmering could. I've heard all I can stand about, "Those no-code Techs!" Take them under

your wings and get them excited about learning the code! In turn, they'll probably upgrade and pass on your wonderful gifts. The greatest tragedy would be to deny young hams a chance to learn. One of the best Elmers in ham history, Doug DeMaw, W1FB, recently became a Silent Key. Who's going to take his place and continue the tradition?—*James Bates, KB8TNQ, Mason, Michigan*

MORSE EXEMPTIONS

◆ When reading the October editorial ("It Seems to Us...Morse Exemptions"), I thought it was a late, or an early, April Fool story. This has to be a joke; the ARRL is spending time, money and effort on a problem that does not exist while the hobby suffers from a wide variety of obvious afflictions.

You are asking the FCC to amend its rules, and you are imposing new policies on your VEs, to address an insignificant percentage of abuses regarding license upgrades. This problem is not worth the effort to count the number of applicants who "might" be abusing the Morse Exemption rules. This is a waste of my dues money.

I suggest that the leadership of the ARRL remove their heads from deep in the sand pit where you have stuck them and stop chasing the demon that does not exist. Turn around and face the real demons nipping at your butts.

Your first effort should be to petition for FCC rule changes that reduce the code requirement to 5 WPM for all license classes and to further pressure the international community to remove the requirement altogether. Morse communication will always have a part in our hobby, but it no longer makes sense to have it as a requirement for licensing.

Next, you should focus your efforts on ways to introduce the hobby to our very young citizens. I'm certain there are many ways to address the very "real" problems facing our hobby now and in the future.

I suggest that the League address the serious issues facing our hobby and ignore the frivolous, as difficult as that may be, or there may be no Amateur Radio to protect.—*John M. Anzivino, WA2QYX, Jersey City, New Jersey*

◆ I was pleased to read "It Seems to Us..." in the October *QST*. The problem of phony medical exemptions for code testing is serious. I'm glad to see that the ARRL

is taking positive action on this issue.

There is another CW testing problem that needs to be addressed along with Morse exemptions—multiple-choice exams.

I don't want to take anything away from those who passed their code tests by using the multiple-choice exams. Many of them truly comprehend Morse code proficiently. What really disappoints me are those who take the code elements and manage to pass *without* true understanding or proficiency. Multiple-choice testing makes this possible. For example, I look at some of the copy sheets and see only shorthand. They get just enough information to figure out the correct multiple-choice answers. Remarking to one of these candidates about his code comprehension elicited this reply: "Hey! I'm a no-code Extra!"

The ARRL offers fill-in-the-blank *and* multiple-choice code exams to its VE teams. But the teams that I've served with have encountered great pressure *against* using the more difficult fill-in-the-blank tests. Arguing against the multiple-choice exams can make one very unpopular, so peer pressure wins the day.

In spite of this sad state of affairs, I will continue my VE activities. Seeing the majority of candidates earning credits the old fashioned way, by studying and practicing, gives me great satisfaction. It's my way of putting back into Amateur Radio what I got out of it. Yes, let's close the medical waver loophole, then re-examine the wisdom of the multiple-choice Morse exam.—*Robin Zinsmaster, N6PHP, Sebastopol, California*

KUDOS TO TEENS!

◆ With reference to the letter from Chris Johnson, AE4KN, in the September, 1997 "Correspondence," all I can say is, "Wow! What a great letter from a younger ham!"

As an old-time ham (licensed for 45 years), I frequently concern myself with exactly the same things that concern this 16 year old.

I have taught code to teenagers, and they pick it up very quickly—which brings me to good quotation from Chris's letter: "It's just not that hard. Kids who learn the code agree, and they'll tell you that it's the adults who are doing most of the anti-code griping." If there are a lot of younger hams out there who have the same attitude as Chris, I'm not going to worry any more about the future of the hobby. I'll bet he

gets great marks in school, too!—*Sumner Weisman, WIVIV, Framingham, Massachusetts*

◆ Three cheers for Chris Johnson, AE4KN, and Daniel Sanderman, KC7RMS (“Teens Speak,” September “Correspondence”)! They called it like it is. It’s great to see young hams speaking out for Amateur Radio. And like Chris says, “...the whining has become tiresome”. If hams don’t want to learn the language of CW, then don’t ask for the privileges or complain if someone else uses the mode. I don’t use CW as much as I want to, but I’ll support those who do. CW has its place. There is more than enough “room” in our diverse hobby for all modes.—*Dennis Barthel, W6HRH, Woodland Hills, California*

A HAPPY ENDING

◆ Early this year I wrote a letter telling of how my wife was turned off by ham radio because of the language used on HF (March 1997 “Correspondence”). I was becoming pretty cynical about Amateur Radio, too.

Well, I received literally dozens of letters in response! Many offered words of encouragement and sympathy. Others offered tips on how to avoid the bad apples.

I upgraded to General a few months ago and I’m enjoying the hobby immensely—even 75 meters! I did as you kind-hearted guys suggested in your letters. I ignored the worst and looked for the best. As a result, I found the Southern Country Cousins Net on 3970 kHz, along with the Popcorn Net and the Good Morning Kentucky Net. What a terrific bunch!

I am happy to report I was wrong; ham radio can still be fun. I’m also dabbling in SSTV, RTTY, CW, and AM and having a ball. And, yes, my wife is revising her opinion of our hobby as well. Thanks for all the encouragement, especially from John, KE4EWS, and Ted, N4XX.—*Rick Wallis, KA4VHV, Resaca, Georgia*

TWELVE THINGS YOU CAN DO

◆ Here are 12 things you can do *today* to benefit Amateur Radio:

1. Get on the air. Make noise. An unused band is a lost band.

2. Learn something about a mode you’ve never tried. In my case, it’s the digital modes and satellites.

3. You’re here to communicate. When someone asks, “Is that a CB radio?” explain what it really is, what you can do with it, and why one would use it.

4. Upgrade, if possible.

5. Go mobile. Make yourself visible. I receive a lot of weird looks when people see the 13-foot tall antenna on my car. But when I ask, “Would you like to know what that monster antenna is for?” they usually say “Yes, but I was afraid to ask.”

6. Try some outdoor events; some friends and I did QRP Afield, a type of QRP Field Day. We put up a 20-foot continuously loaded whip on a 32-foot mast in the

middle of a field. No fewer than a dozen people, including a bunch of 12-14 year-olds, came by to take a look.

7. Lose your shyness about our hobby. Most people these days are clueless about ham radio; be a ham radio emissary. Be their first exposure to radio, so they can develop some positive ideas about hams before someone else gets to them.

8. Make a contact on HF SSB in front of a crowd of kids. They do think it’s cool (trust me)! Hand ‘em the mike and see if they’re unimpressed!

9. Explain how repeaters work and who can “own” or construct one. Do an on-air demo. Explain how we use satellites, and even bounce signals off the moon.

10. If possible, make a CW contact for the same group of kids. Remember that CW is mysterious to most people—and that’s its attraction. Play the mystery for all it’s worth, then show them how to “solve” it.

11. Do public service events and wear your call-sign badge proudly. Crank up the volume on your H-T!

12. Talk enthusiastically to new hams. Your attitude goes a long way toward forming their impressions.—*Scott Rosenfeld, NF3I, Burtonsville, Maryland*

DONATE!

◆ Here is an easy way for your radio club to increase public awareness of Amateur Radio, the ARRL, and the club itself. The effort is minimal and all it costs is money. Simply donate a subscription to *QST* to your local public library.

Many public libraries are on tight budgets. They are sure to welcome a free donation of a magazine subscription. There should be little effort involved for them. Often, all they need to do is put the magazine in a nice plastic cover. They should be more than willing to let you put a notice on the cover saying, “This magazine donated by the Podunk Hollow Amateur Radio Club.” You might even be able to list a club contact person, a meeting notice, or the local repeater frequency.

How does this help Amateur Radio? Someday soon, a ham-of-the-future will be in the library looking for something to read. Once he picks up *QST*, he’s hooked. By the same token, the ham who has been inactive for 30 years will pick up *QST* and find out all the wonderful things he’s missed. In both cases, Amateur Radio benefits.

How does this help the ARRL? The new ham and the old-timer will both see all the things the League has to offer. They’ll be dying to join the ARRL. The ARRL benefits.

How does this help the local radio club? The new ham, the old-timer, the lost local, and the ham who just moved into town are all looking for a radio club. Your notice on the cover gives them all the information they need to find you. Your club benefits.—*Al Bates, W1XH, Chelmsford, Massachusetts*

QST

DSP Software

DSP Blaster™ 2.0 uses your PC and sound card to provide tunable highpass, lowpass, and bandpass filters, autotracking CW peaking filter, automatic notch filter, coherent phase-locked CW processor with stereo output, adaptive noise reduction, and AGC. *DSP Blaster* graphs the audio waveform, spectrum, and CW phase. A system block diagram simplifies use. Just mouse-click a filter block to activate it. *DSP Blaster* lets you dig dirt-weak signals out of the noise, makes listening much more pleasant, and can run in the background. \$125. Notch filter alone, \$35.

RITTY 2.0 is a high-performance DSP modem for RTTY and PACTOR. The limiterless front-end, sharp BPF, autotuned optimal filters, ATC, polar-flutter suppressor, numerical flywheel, packet repair, and memory-ARQ recover signals other modems can’t. *RITTY* features an FFT spectral tuning indicator that’s better than a scope, a demodulated-signal display, variable mark/space frequencies, precision AFSK, FSK & PTT outputs, and supports WF1B’s RTTY-contest logger. \$150.

486DX, VGA, and 16-bit Creative Labs sound card required (“compatible” cards won’t work). Both DSP programs, \$250.

Antenna Optimizers

AO 6.5 automatically optimizes antenna designs for best gain, pattern, impedance, SWR, and resonance. *AO* uses an enhanced, corrected MININEC algorithm for improved accuracy. *AO* features 3-D radiation patterns, 3-D geometry and wire-current displays, 2-D polar and rectangular plots with overlays, automatic wire segmentation, automatic frequency sweep, skin-effect modeling, symbolic dimensions, symbolic expressions, current sources, polarization analysis, near-field analysis, and pop-up menus.

NEC/Wires 2.0 accurately models true earth losses, surface waves, and huge arrays with the Numerical Electromagnetics Code. Best for elevated radials, Beverages, wire beams, giant quads, delta loops, LPDAs, local noise.

YO 6.5 automatically optimizes monoband Yagi designs for maximum forward gain, best pattern, minimum SWR, and adequate impedance. *YO* models stacked Yagis, dual driven elements, tapered elements, mounting brackets, matching networks, skin effect, ground reflection, and construction tolerances. *YO* optimizes Yagis with up to 50 elements and does it hundreds of times faster than NEC or MININEC.

NEC/Yagis 2.5 provides reference-accuracy modeling of individual Yagis and large arrays. Use *NEC/Yagis* to model big EME arrays.

TA 1.0 plots elevation patterns for HF antennas over irregular terrain. *TA* accounts for hills, valleys, slopes, focusing, shadowing, diffraction, reflection, diffraction-excited reflection, and finite ground constants. Use *TA* to optimize antenna height and siting for your particular QTH. Requires topographic map.

One antenna program, \$70; three, \$120; five, \$200. 386, math coprocessor, VGA required. Visa, MasterCard, Discover, U.S. check, cash, or money order. Add \$5 overseas.

**Brian Beezley, K6STI • 3532 Linda Vista
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NEW SYNTHESIZED VHF FM EXCITER & RCVR MODULES

No more waiting for crystals!

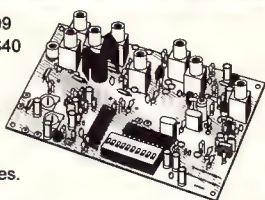
Hamtronics is pleased to announce a new line of its vhf fm transmitters and receivers, popular for repeaters, voice and data links, control, telemetry, and other demanding applications.

New T301 Exciter and R301 Receiver provide high quality nbfm and fsk operation on 144-148 MHz (and 148-174 MHz for export and gov't services). Features include:

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- Exceptional modulation for voice and ctcss.
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- Commercial grade txco for tight frequency accuracy in wide range of environmental conditions: 2ppm -30 to +60°C.
- Rated for continuous duty, 2-3W output.
- In stock for same day shipping.

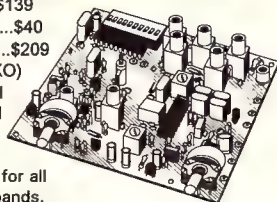
TA301 EXCITER

- Kitonly \$109
- TCXO option ...\$40
- Wired/tested
...\$189
(includes TCXO)
- Inquire about
models for
higher frequencies.



R301 RECEIVER

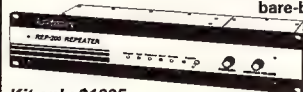
- Kitonly \$139
- TCXO option ...\$40
- Wired/tested ...\$209
(includes TCXO)
- Our traditional
crystal-control
receivers and
exciters are
still available for all
vhf and uhf bands.



You get more features for your dollar with our:

REP-200 REPEATER

A microprocessor-based repeater with autopatch and many versatile dtmf control features at less than you might pay for a bare-bones repeater or controller alone!



Kit only \$1095
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50-54, 143-174, 213-233, & 420-475MHz. (902-928, slightly higher.)

Now - 2 meter machines in stock for
next day shipment! Call for details.

See prior months' ads for more products. We make a full line of VHF & UHF FM Xmters & Rcvrs, PA's, Data Modems, Preamps, Helical Filters, Repeater Controllers, Autopatches, DTMF and Subaudible Tone Decoders, Digital Voice Recorders, WWV Rcvrs, Weather Fax Rcvrs.

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This Month in Amateur Radio

Ask people to name their favorite months of the year and December is likely to be near the top of most lists. Regardless of which religious faith you hold, if any, you can't help feeling the warmth and fellowship of the Holiday Season. Even the most curmudgeonly among us find reasons to smile this month!

We get off to an exciting start with the **ARRL 160-Meter Contest**, December 5 through 7. If you don't have a dedicated 160-meter antenna, put up as much wire as possible, feed it with an antenna tuner and have fun! See the complete rules on page 107 of your November *QST*.

Oh little town of Bethlehem ...

Bethlehem, Connecticut, is the site of the "Christmas from Bethlehem" celebration throughout December. Listen for the Hen House Gang station, W1FHP, on 40 and 20 meters.

Bethlehem, Indiana, is observing the season December 12 and 13. The Clark County Amateur Radio Club will have W9WWI on the air on 80 and 40 meters.

Bethlehem and Nazareth, Pennsylvania, will be on the bands with an appropriate call sign, WX3MAS, December 13 and 15.

Santa Claus is coming to town ...

From St. Nick's "midwestern office" in **Santa Claus, Indiana**, the Legion of Indianapolis DXers will be operating W9IND on December 13 and 14.

If you don't find the jolly old elf in Indiana that weekend, look in **Edgewater, Florida**. That's where Coronado Wireless Association (KE4AG) will be taking to the airwaves for their annual Christmas event.

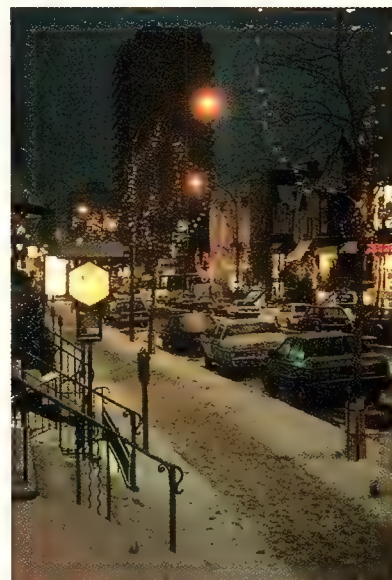
With all the Christmas activity on the weekend of December 13 and 14, we hope Santa will have time to participate in the **ARRL 10-Meter Contest**. In case you haven't heard the news, sunspots are on the increase. Will their influence be felt during this year's contest? The only way to know is to get on the air.

December ends, as it always does, with a bang...

On December 28 the Radio Amateurs of Canada kick off their 24-hour **Winter Contest**. See their contest Web site at <http://www.rac.ca/CANWIN.htm>.

Three days later we ring in 1998 with the **ARRL Straight Key Night**. Celebrate the new year by reacquainting yourself with CW à la straight key. See the announcement in this issue.

And while you're singing Auld Lang Syne to your friends and neighbors, take a break and check out the New Year special-event stations in **Fullerton, California (W6ULI)**, and **Rockford, Illinois (W9AXD)**. You'll find details on all Holiday Season operations in "Special Events."



WE'RE STANDARD AND WE'VE GOT YOUR STYLE!

STANDARD PIONEERS ANOTHER FIRST!! THE C5718DA & C1208DA IS PACKET READY!

Designed with packet in mind. Out-of-the-box high-speed, 9600 baud, interface. Just connect your TNC to the radio and you're on the high speed packet network. Also, operates at 1200 and 2400 baud equally well.

**Superior
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C5718DA



C1208DA



C5718DA TWIN-BAND MOBILE
50 Watts of power totally controlled from the microphone! Remote this radio anywhere!

Unsurpassed intermod rejection.

Built in Antenna Duplexer.

Dual frequency receive; two VHF,

two UHF, or VHF/UHF.

Frequency range:

Receives 110-199.995 MHz (including AM aircraft) and 250-499.995 MHz.

50 Watts 2M, 40 Watts 70cm

(3W Low, 10W Medium selectable)

Memories: 40 (20 per band); stores frequency, offsets and CTCSS tones.

200 memory channel option, CMU182.

CTCSS Encode/Decode standard.

Frequency steps, 5, 10, 12.5, 15, 20, 25, 50 and 100 Khz.

Full Duplex cross band operation with CTCSS tones.

Paging/Coded squelch.

DTMF autopatch dialing, 6 memories, 15 digits.

Eight kinds of scan, including priority and CTCSS.

Memory scan lock-out.

Back-lit Keypad and Display

Auto mute opposite band, three settings

(-6, -12 and -18dB).

Cooling fan built-in.

Size: 5.51"W 1.57"H 5.31"D Weight 2.2 lbs..

Mobile bracket and power cord (2M) included.

STANDARD HAS EVERYTHING IN THE SPEAKER-MIC WHILE DELIVERING UP TO 50 WATTS!

C1208DA TWIN-BAND MOBILE

The smallest, lowest price 2 meter mobile radio that delivers all the features. Mount it under a seat or even in the trunk using the optional extension cable (CAW561 or CAW562).

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50 Watts, 10W and 3W selectable

Built in Antenna Duplexer for 450 MHz receive

Memories: 100; stores frequency, offsets and CTCSS tones.

CTCSS Encode/Decode standard.

Frequency steps, 5, 10, 12.5, 15, 20, 25, 50 and 100 Khz.

Paging/Coded squelch.

DTMF autopatch dialing, 10 memories, 15 digits.

Six kinds of scan, including priority and CTCSS.

Back-lit Keypad and Display

Auto mute: four settings (-10, -20, -30 and off)

Semi Duplex cross-band operation with CTCSS tones

Cooling fan built-in

Size: 5.51"W 1.18"H 5.79"D Weight 1.65 lbs..

Mobile bracket and power cord (3M) included.

MARS and CAP modification available (permit required).

Specifications, features and price are subject to change without obligation or notice.

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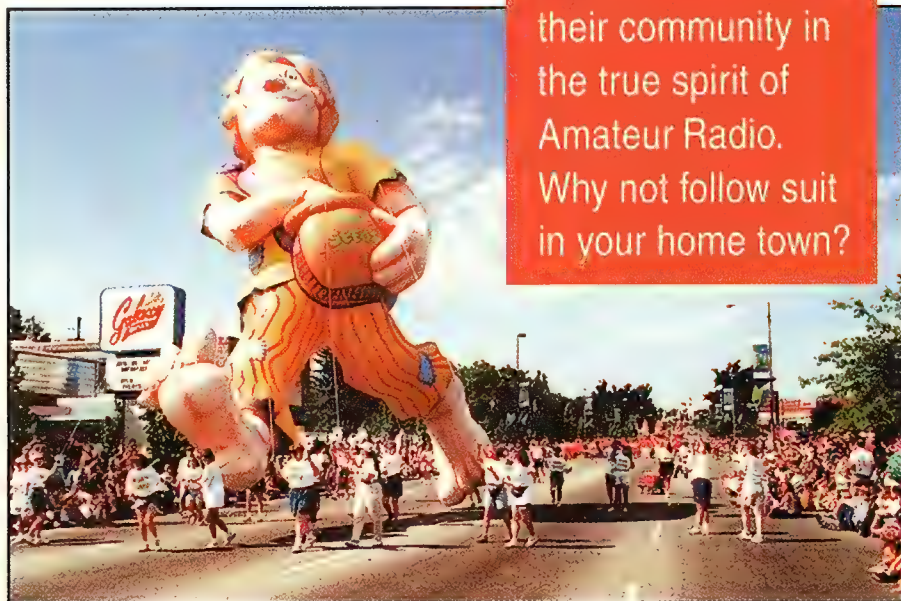
The Boise River Festival: An Amateur Radio Showcase

Balloons over Boise! Seventy hot-air balloons launched at sunrise on Saturday.

The Boise River Festival is a showcase for Amateur Radio public service technology that got its start with the first Boise River Festival some six years ago. Boise Police Officer Harry Kindelberger came to a Voice of Idaho Amateur Radio Club meeting looking for volunteers to help with traffic and crowd control at the Saturday morning River Giants Parade. At that time, the Nite-Light Parades were held on the Boise River.

For the seventh year, club members and other area hams again played a key role in the 1997 event, held June 26-29. Hams helped with traffic control before, during and after the parades; they provided visual amateur television (ATV) links to help officials with crowd management; and they patrolled the perimeter of the fireworks area.

The great thing about using hams for this kind of duty is that actions over the entire parade route can be coordinated instantly via hand-held radio. Traffic barricades—manned by hams and used to secure the parade routes—can be erected and



Each year, nearly a million visitors flock to Idaho's Boise River Festival for a little summer fun. To help things run smoothly, members of the Voice of Idaho ARC, and other area hams, volunteer their time to provide communications and event coordination to local agencies. (All photos supplied by the authors.)

Thanks to an ever-evolving mix of dedication, technology and ingenuity, Boise, Idaho, hams serve their community in the true spirit of Amateur Radio. Why not follow suit in your home town?

Aaron Ryneerson, KC7OWJ (left), and Hans Blohm, KC7MWA (right), operate one of the ATV mobile units.



Mike Hardcastle, KB7TRJ, and his self-contained APRS unit.



Brian Mahaffy, N6UGP, net control operator in the Ada County ham van.



Mike Hardcastle, KB7TRJ, Voice of Idaho ARC membership director, and Steve Wade, KF7YC, VOI newsletter editor and ARRL public information officer, discuss ham activities in support of the festival on KIDO's "PM Idaho" show.

removed when needed, minimizing traffic disruptions. Hams serve as additional eyes and ears when it comes to public safety. And because we're in close contact with the Boise PD, whenever trouble erupts we can report it immediately. The Boise hams have become known as Festival Ambassadors. If we can't answer questions about festival events, locations, schedules, etc, we can quickly call someone who can.

Moving the Nite-Light Parades to downtown streets in 1994 added another dimension to parade duty—night operations. With the crowds growing year after year, the Boise PD needs all the help it can get to ensure public safety.

Coordinating all the radio traffic requires the use of the Ada County Amateur Radio communications van and two or more net control operators. A packet radio link ensures solid, secure communication between the van and the command center. As an added benefit, the digital data link provides silent communication in the noisy command center environment.

About the second or third festival, someone—probably Mr ATV himself, Brian Rayl, N7MOE—brought up the idea of using amateur television to provide real-time images of remote festival locations to the Boise PD Command Center. This has worked well over the years, and festival officials are quick to take advantage of their remote eyes and ears. The PD dispatches an ATV crew to spots that need surveillance. Detailed instructions (tilt, pan, zoom) are communicated via two-way radio while the duty officer watches the live video feed. Soon after ATV's initial success we added video taping capabilities at the command center. With ATV we helped children find lost parents, recorded traffic accidents, and even taped an assault on an officer!

ATV teams started out on foot, but to gain more mobility, the operators switched to bicycles. (In recent years the PD has also provided golf carts.) Three ATV teams are deployed in the field; one transmits continuously on 426.25 MHz while two other teams share 434 MHz on a rotating basis. One 434-MHz crew transmits while the other crew is in transit to an assigned location. When the in-transit crew reaches their destination, they go on the air and the first 434-MHz crew shuts down and starts moving to *their* new assignment. If either crew spots trouble, they call it in and quickly begin sending video (if they aren't already). Two big-screen TVs in the command center allow the watch commander to monitor both 426.25 and 434 MHz channels simultaneously.

This year, a new dimension was added to give festival and police officials real-time information on the progress of the festival's three parades (two evening Nite-Lite parades and the Saturday morning River Giants parade). Two self-contained Automatic Position Reporting Systems (APRS) were used, along with four fixed units. The portable units were placed on

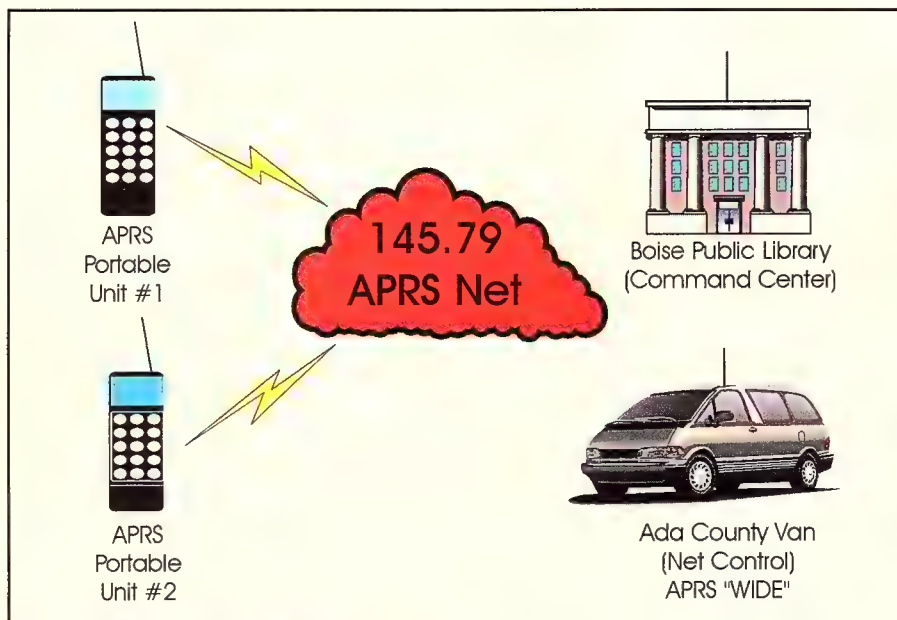


Figure 1—To provide served agencies with real-time parade progress reports via computer, Voice of Idaho ARC members implemented this position reporting system.

floats and tied into the APRS network. Each APRS unit consists of a Global Positioning System (GPS) receiver listening to a constellation of satellites to determine its position. Every few seconds the GPS receiver automatically feeds this information to an attached packet station (TNC and H-T) operating in beacon mode to transmit the coordinate data.

At the command center, a video projector was used to display a large computer-generated image of the parade's progress. Festival officials were amazed at the sophistication and usefulness of APRS ham radio technology.

Local media outlets—newspaper, radio and television—have been great in getting out information about our festival involvement. Nearly a million visitors participate in the festival each year, making it the largest event in Idaho and one of the premiere events in the country. Attendees spend some \$40 million annually in Boise and the surrounding communities, making the festival an important financial booster for this part of Idaho.

The 1997 festival was supported by 35 operating committees and volunteers who provided more than 40,000 hours toward making the event a success. Participation of the Amateur Radio community, as usual, is on a volunteer basis as well, and most hams use their own or club-owned equipment.

In Boise, public service is what ham radio is all about!

Barrett is president and Wade is newsletter editor and public information officer of the Voice of Idaho Amateur Radio Club in Boise, Idaho, an ARRL Special Service Club. You can reach Steve Wade at 7097 Garden Glen Ln, Boise, ID 83703, e-mail KF7YC@rmci.net



Voice of Idaho Amateur Radio Club president Tony Barrett, N7MTZ (right), is interviewed by a crew from KTVB-TV during the festival.

Public Service Resources

Public service communication has been a mainstay of the Amateur Radio Service since 1913. In today's world of Amateur Radio, disaster and public service communication is a highly organized and worthwhile part of day-to-day operation, implemented mainly through the Amateur Radio Emergency Service (ARES) and the National Traffic System (NTS), both sponsored by ARRL. The Radio Amateur Civil Emergency Service (RACES), independent nets and other amateur public service groups are also a part of ARRL-recognized Amateur Radio public service efforts.

To learn more about the services mentioned above, and to get your start in public service communications, call or write to the League's Field Services Department at ARRL HQ or check out the following ARRL publications, which can be found in the Public Service section of the League's on-line Publications Catalog at <http://www.arrl.org/catalog>.

The *ARRL Public Service Communications Manual (PSCM)* serves as an overall source of basic information on the League's public service communications program. Comprising 61 pages in its printed form, the PSCM is also available via *ARRLWeb* in two formats: Hypertext Markup Language (HTML) and Adobe Portable Document Format (PDF).

The *ARES Field Resources Manual* is a quick trainer and resource guide for every emergency communicator. Also useful is the *Special Events Communications Manual*, which is full of tips and suggestions to help plan effective special-event communication activities. A more advanced offering is the *ARRL Emergency Coordinator's Manual*, which covers some of the finer points of Emergency Coordinator duties, as well as recruiting and obtaining the necessary resources to properly plan and implement effective emergency and disaster communications.

QST



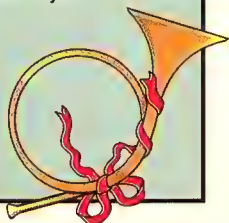
Season's Greetings



from the ARRL Staff and Contributing Editors

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 Rosalie White, WA1STO
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 Mark Wilson, K1RO
 Dan Wolfgang
 Jean Wolfgang, WB3IOS
 Larry Wolfgang, WR1B
 Janice Wytas



W1AW schedule

Pacific	Mtn	Cent	East	Sun	Mon	Tue	Wed	Thu	Fri	Sat				
6 am	7 am	8 am	9 am	<div></div> <div>Visiting Operator Time</div>				Fast Code	Slow Code					
7 am	8 am	9 am	10 am					Code Bulletin						
8 am	9 am	10 am	11 am					Teleprinter Bulletin						
9 am	10 am	11 am	noon											
10 am	11 am	noon	1 pm											
11 am	noon	1 pm	2 pm											
noon	1 pm	2 pm	3 pm											
1 pm	2 pm	3 pm	4 pm	Slow Code	Fast Code	Slow Code	Fast Code	Slow Code	Fast Code	Slow Code				
2 pm	3 pm	4 pm	5 pm	Code Bulletin										
3 pm	4 pm	5 pm	6 pm	Teleprinter Bulletin										
4 pm	5 pm	6 pm	7 pm	Fast Code	Slow Code	Fast Code	Slow Code	Fast Code	Slow Code	Fast Code				
5 pm	6 pm	7 pm	8 pm	Code Bulletin										
6 pm	7 pm	8 pm	9 pm	Teleprinter Bulletin										
6 ⁴⁵ pm	7 ⁴⁵ pm	8 ⁴⁵ pm	9 ⁴⁵ pm	Voice Bulletin										
7 pm	8 pm	9 pm	10 pm	Slow Code	Fast Code	Slow Code	Fast Code	Slow Code	Fast Code	Slow Code				
8 pm	9 pm	10 pm	11 pm	Code Bulletin										
9 pm	10 pm	11 pm	Mdnte	Teleprinter Bulletin										
9 ⁴⁵ pm	10 ⁴⁵ pm	11 ⁴⁵ pm	12 ⁴⁵ am	Voice Bulletin										

W1AW's schedule is at the same local time throughout the year. The schedule according to your local time will change if your local time does not have seasonal adjustments that are made at the same time as North American time changes between standard time and daylight time. From the first Sunday in April to the last Sunday in October, UTC = Eastern Time + 4 hours. For the rest of the year, UTC = Eastern Time + 5 hours.

□ Morse code transmissions:

Frequencies are 1.818, 3.5815, 7.0475, 14.0475, 18.0975, 21.0675, 28.0675 and 147.555 MHz.

Slow Code = practice sent at 5, 7½, 10, 13 and 15 wpm.

Fast Code = practice sent at 35, 30, 25, 20, 15, 13 and 10 wpm.

Code practice text is from the pages of QST. The source is given at the beginning of each practice session and alternate speeds within each session. For example, "Text is from July 1992 QST, pages 9 and 81," indicates that the plain text is from the article on page 9 and mixed number/letter groups are from page 81.

Code bulletins are sent at 18 wpm.

W1AW qualifying runs are sent on the same frequencies as the Morse code transmissions. West Coast qualifying runs are transmitted on approximately 3.590 MHz by W6OWP, with K6YR as an alternate. At the beginning of each code practice session, the schedule for the next qualifying run is presented. Underline one minute of the highest speed you copied, certify that your copy was made without aid, and send it to ARRL for grading. Please include your name, call sign (if any) and complete mailing address. Send a 9x12-inch SASE for a certificate, or a business-size SASE for an endorsement.

□ Teleprinter transmissions:

Frequencies are 3.625, 7.095, 14.095, 18.1025, 21.095, 28.095 and 147.555 MHz.

Bulletins are sent at 45.45-baud Baudot and 100-baud AMTOR, FEC Mode B. 110-baud ASCII will be sent only as time allows.

On Tuesdays and Saturdays at 6:30 PM Eastern Time, Keplerian elements for many amateur satellites are sent on the regular teleprinter frequencies.

□ Voice transmissions:

Frequencies are 1.855, 3.99, 7.29, 14.29, 18.16, 21.39, 28.59 and 147.555 MHz.

□ Miscellanea:

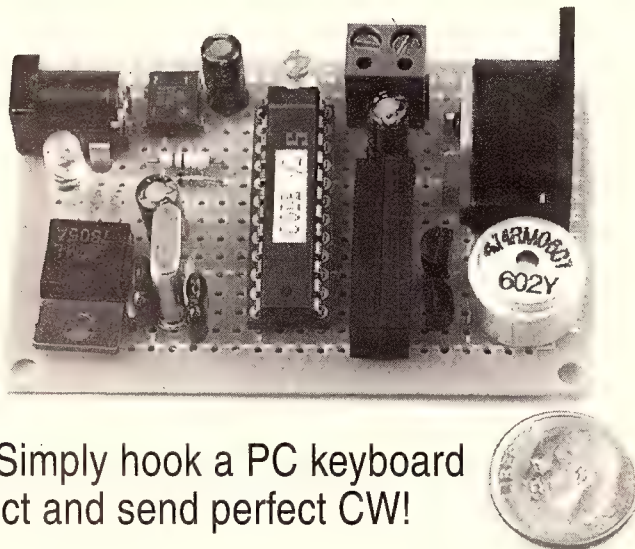
On Fridays, UTC, a DX bulletin replaces the regular bulletins.

W1AW is open to visitors during normal operating hours: from 1 PM until 1 AM on Mondays, 9 AM until 1 AM Tuesday through Friday, from 1 PM to 1 AM on Saturdays, and from 3:30 PM to 1 AM on Sundays. FCC licensed amateurs may operate the station from 1 to 4 PM Monday through Saturday. Be sure to bring your current FCC amateur license or a photocopy.

In a communication emergency, monitor W1AW for special bulletins as follows: voice on the hour, teleprinter at 15 minutes past the hour, and CW on the half hour.

Headquarters and W1AW are closed on New Year's Day, President's Day, Good Friday, Memorial Day, Independence Day, Labor Day, Thanksgiving and the following Friday, and Christmas Day.

A Computer Keyboard CW Encoder



After many years of CW inactivity, I felt the urge to renew my many memorable experiences of past CW QSOs. So I bought a hand key, switched my rig to CW and let fly! I jumped right in by using my straight key to answer a CQ being sent at a moderate speed—I wanted to ease the pressure of my first contact. I was surprised to discover that *receiving* CW was as easy as it was 20 years ago! *Sending*, however, was painful for me—literally—and probably just as mentally painful for my QSO partner, as I struggled to coordinate my hand, timing and thoughts.

My sending needed help, and I sought a solution more agreeable to me than practicing with any type of hand key. My thoughts drifted to using a PC keyboard. After all, I—like so many of us these days—use a PC keyboard at work and at home. My need and that idea resulted in the design and construction of the simple project described here. Cost? About \$35. That's cheap enough, isn't it?

Design

My desire for simplicity centered the design around a single, easy-to-interface, 24-pin DIP microcontroller: the 87C751. As you can see in Figure 1, the number of external components required are few: a crystal and two small capacitors for the clock, and a diode/capacitor combination to supply a power-on reset pulse. Pins 18 and 19 of U1 connect directly to a PC/AT-compatible keyboard's **SERIAL CLOCK** and **DATA** lines for input. Pins 13 and 16 deliver the resultant key closure (negative true and positive true) outputs. Pin 13 is connected directly to a reed relay coil and the **KEY ACTIVE** LED, DS1. U1 delivers a 500 Hz sidetone output that is given a current boost by Q1 and Q2 to drive a subminiature audio transducer, LS1. The remaining circuitry simply handles the dc input voltage, of either polarity, to provide a stable 5 V source for the microcontroller and keyboard.

No PC needed! Simply hook a PC keyboard to this little project and send perfect CW!

Construction

In my prototype, I soldered the parts to a single 2.85×1.85-inch Radio Shack project board, but a PC board is now available.¹ If you're using the PC board, just "stuff the parts." Here's my approach to using the project board: I placed all the components on the nonfoil side of the project board (the side with the silk-screened grid legend). The component leads and pins enter the holes of the 0.1-inch grid. (The pins of dc input jack J2 require their mounting holes first be enlarged using a 7/64-inch bit.) As you mount each component, solder its leads to the copper pads, then trim the leads as short as possible. I soldered insulated wire lengths—I like #30 silver-plated wire-wrap wire because of its sturdiness—to each pad that corresponds to that component's connection in the schematic. Generally, component placement is not critical. The only areas that theoretically could be sensitive are associated with the microprocessor clock, U1 pins 10 and 11 with Y1, C3 and C4, and their associated ground connections. Keep leads in those areas short.

As supplied by Digi-Key, the audio transducer has a strip of clear tape on it; remove the tape for increased loudness. (It makes a major difference!—Ed.) The circuit has no volume control, so keep the tape handy if you want quieter operation.

Final Steps

Insert U2 into its socket, aligning the notch at its top toward the pin 1 end. Plug a tested PC/AT keyboard into the 5-pin DIN socket at J1. J2 accepts the larger (0.212-inch diameter) plug of a dc adapter (wall transformer or "wall wart"). Ensure the power supply provides an output voltage of 7.5 to 13.5 V at 200 mA. The upper-voltage limit is dictated primarily by the power dissipation of voltage regulator U2. (A standard 12 V, lead-acid battery with the charging system fully on will not carry excessive voltage.)

Connect a length of two-conductor wire to pins 1 and 2 of TB1, then to a plug that mates with the key jack of your transmitter. (I keep a hand key connected in parallel with the terminal block.) If you don't enclose the PC board in a cabinet, mount the assembly to your transmitter or desk using 3/4-inch-wide adhesive-backed Velcro strips or double-stick tape. If you've used project-board construction, make sure the component pins are short and that the connecting wires are kept close to the board for the adhesive to bond to the wire side of the board.

Operation Basics

When power is applied, the keyboard's LEDs should flash momentarily. The keyboard then performs a basic assurance test, which can take up to five seconds. After that, press any letter key *twice* and you should hear *one* corresponding Morse-code character issue from the speaker. (The first

¹Notes appear on page 35.

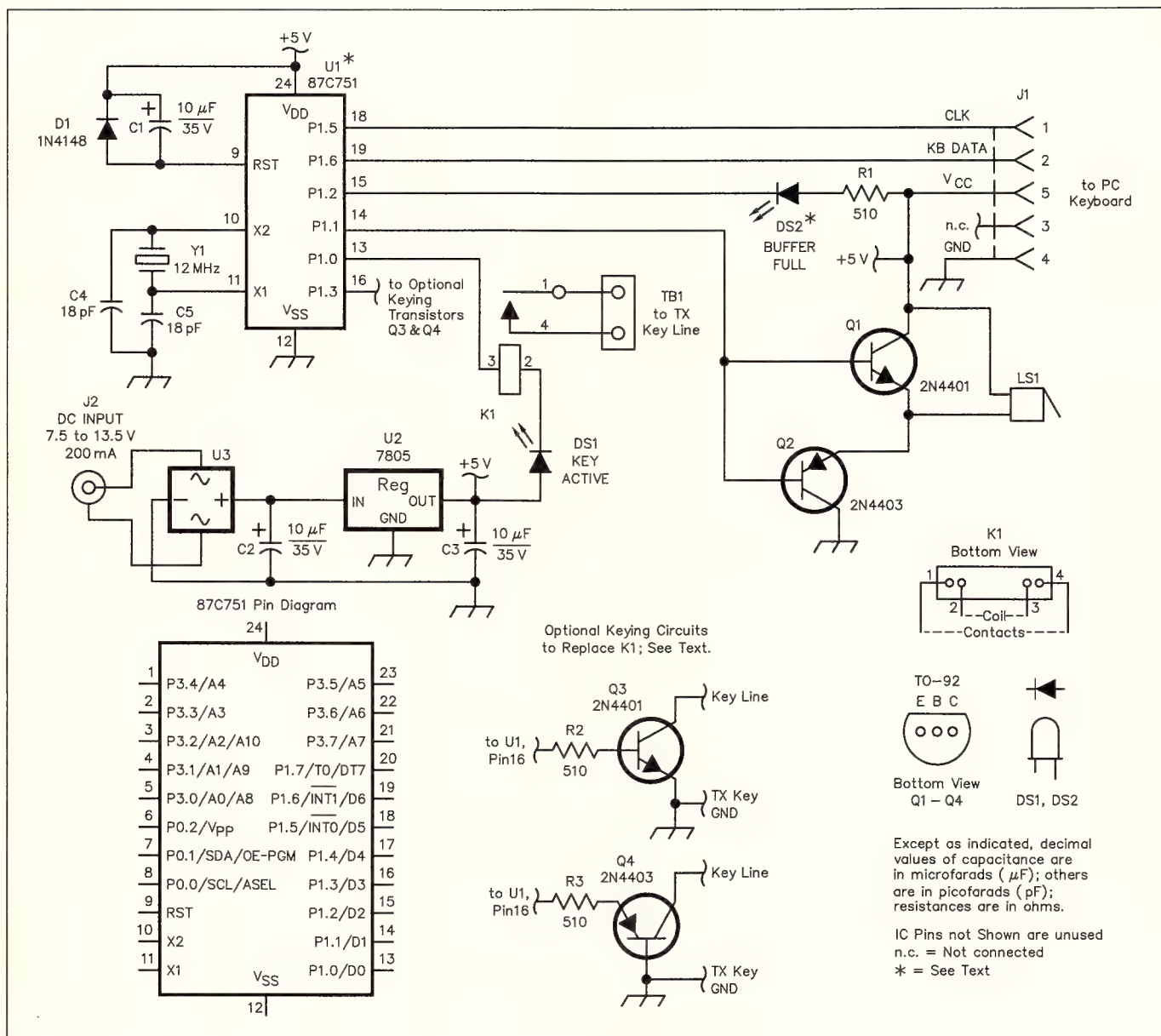


Figure 1—Schematic of the CW encoder. Equivalent parts can be substituted. Resistors are $\frac{1}{8}$ W, 5% tolerance carbon-composition or film units. DK = Digi-Key; M = Mouser; RS = Radio Shack. Most parts are available from Digi-Key Corporation, 701 Brooks Ave S, PO Box 677, Thief River Falls, MN 56701-0677; tel 800-344-4539, fax 218-681-3380; <http://www.digikey.com/>.

C1-C3—10 μ F, 35 V aluminum electrolytic (DK P6248)
 C4, C5—18 pF, 100 V ceramic (DK P4840)
 D1—1N4148 silicon diode (DK 1N4148CT)
 DS1, DS2—LED (DK HLMP-3300QT)
 J1—5 pin DIN socket to mate with keyboard used (DK CP-2350)
 J2—Coaxial (or other) dc input jack (M 16PJ031; available from Mouser

Electronics, 2401 Hwy 287 N, Mansfield, TX 76062, tel 800-346-6873, 817-483-4422, fax 817-483-0931; <http://www.mouser.com/>).
 K1—SPST reed relay (DK HE200)
 LS1—Audio transducer (DK P9978)
 Q1, Q3—2N4401 (DK 2N4401)
 Q2, Q4—2N4403 (DK 2N4403)
 R1-R3—510 Ω , $\frac{1}{8}$ W (DK 510EBK)
 TB1—Two-position terminal board

(DK ED1601)
 U1—Programmed 87C751; see Note 1.
 U2—5 V, 1 A positive regulator; 7805 (RS 276-1770) or LM340T (DK LM340T-5.0)
 U3—1 A, 200 V bridge rectifier (DK DF02MGI)
 Y1—12 MHz crystal (DK CTX058)
 Misc: PC board (see Note 1), perf board (RS 276-149), skinny DIP socket (0.3 inch pin centers) for U1 (DK A405), hardware, enclosure.

key press after power-on—whenever it is made—is not seen by the code controller.)

As shown in Table 1, all letter and number keys and generally used punctuation marks have valid key codes. The **SHIFT** key and characters associated with its use are nonfunctional. Prosigns are handled by seven of the numeric key pad keys.²

The encoder's default speed is 15 WPM. To change the speed, push the **F9** key followed by *two* digits representing the code

speed. For example: Press **F9**, then **08**, for 8 WPM, or **F9**, then **36** for 36 WPM. The valid range of speed is from 4 to 69 WPM. To turn off the sidetone, press the **F12** key once. Pushing **F12** again restores the sidetone. Whether or not the sidetone is activated, DS1 blinks when the key line is active.

Message Buffers

Two message buffers are available. To-

gether they hold a maximum of 25 characters, including spaces. For example, one buffer can be loaded with *CQ CQ CQ de W6NKS*, and the second reserved for the other party's call sign, or your location and/or name, contest information, etc. Push **F5** to load buffer 1 and clear buffer 2. Enter the sequence desired then terminate the entry with the **Enter** key. Similarly, push **F6** to load buffer 2. Note, that pushing **F6** clears buffer 2 only, while pushing **F5** clears both

Table 1
Special Characters, Function and Numeric Keypad Assignments

Character or Key	Code
Question mark ? (not SHIFT ed /)
Left parentheses [(left bracket)
Right parentheses] (right bracket)
Apostrophe '
Colon : (not a SHIFT ed semicolon ;)
Hyphen -
Double dash =
Back slash \
Error sign (Tab or Backspace)
Ctrl (use for prosigns; see text)	Removes space between successive characters
Esc	Clears keyboard and user-defined buffers, and restores all defaults

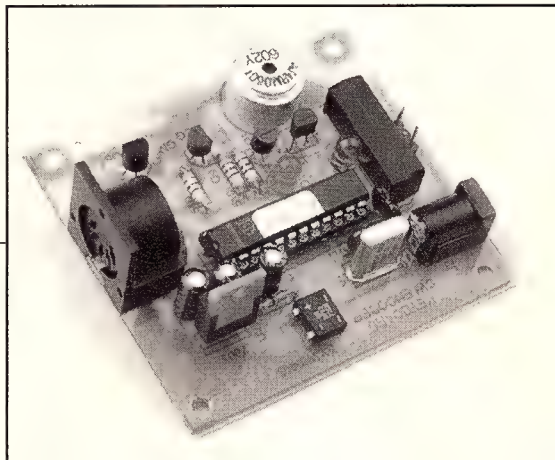
Function Key Assignments

Key	Function
F1	Sends contents of user-defined buffer 1.
F2	Sends contents of user-defined buffer 2.
F5	Clears buffers 1 and 2, allows character entry to buffer 1.
F6	Clears buffer 2, allows character entry to buffer 2. (Press Enter to end)
F9	Changes output code speed. Enter two digits, ie, 08 for 8 WPM.
F10	One minute code speed test by sending PARIS, then space, WPM times.
F11	Enter code-practice session. Sends 120, 5-letter groups. Press Esc key to end.
F12	Toggle sidetone on and off.

Prosign and Numeric Key Pad Assignment

Prosign	Key	Morse Code
AR	0
AS	1
KN	2
SK	3
BK	4
SN	5
KA	6

Here's the FAR Circuits version of the encoder. Provisions exist to mount the optional keying transistors and their respective components.



buffers. To insert the buffer into the CW encoder output, press **F1** for buffer 1, or **F2** for buffer 2. Also, be sure to include spaces at the beginning or end of the sequence, as appropriate, if the buffer information is to be inserted or appended to an outgoing data stream.

QSOs

The encoder will not continuously hold the key down (as for tune-up) or provide for nonstandard key sequences, so it's useful to have a mechanical key or switch attached in parallel with the key line. (The key can act as a backup for the encoder when that is difficult or inappropriate to use.) If the circuit's power supply is turned off and on, you'll need to reset any defaults you've changed.

As you operate the encoder, you will notice that it is important to insert spaces in

order to provide the correct timing between words. Obviously, if you are typing letters and words slower than the output speed, spacing and the use of the space bar is irrelevant. Type-ahead is allowed. You can enter up to 12 characters including spaces, ahead of the output encoding. For the ultimate in smooth output, it's necessary to maintain at least one character in the buffer, but this is difficult to do. Here are two techniques that I have found useful: Rapidly key one word at a time (no commonly used words I can think of have 12 letters), wait for the last character to be sent, then enter the next word. Another technique is to visually observe DS2, which indicates keyboard buffer status. As you type, DS2 illuminates when the buffer is three characters short of being full, at which time you should enter the last couple of characters, or a space, then stop typing.

Table 2
Code Practice Check List

AUG4V	RM741	G5ZSK	ADNFF
0QEAA	NTUVV	FXQMC	V33SK
6198T	FQ16H	3500W	OJK5A
NDYCA	8JJVY	51RH1	QQ91D
VN1VU	NFIP3	S02MG	XRCZS
F9F7Y	KPC9Y	F64UG	G4RFS
1OKUY	2ZREN	5BSXP	D98TM
QN5LQ	JOK1U	H25OS	7A0UB
TG5WX	H5ED1	L8KMF	15ZV1
JFAC4	5HETA	EQ2YT	CPHZK
PIUTW	FS9Z8	GMG0Q	0DWDP
8B7KI	2OHVW	QQVW5	4WZUN
G1T7I	GVZVM	RC1WW	Y3FU6
7W1BY	0LULG	D651F	LCCX4
TQOKQ	SFL1L	4961K	8EC3S
V9C6X	LDSIK	8TXER	NR3SN
YTVOA	ZDW6R	1RN3T	M9WGN
E19WB	LCXE5	6VZ5A	EZWHC
GWMLN	X34SV	37FWO	JE5CP
UKTIL	D4EK3	731WN	5I6II
TOBCS	PDJ7I	FE8CB	CM7OP
95T5Y	OJAS9	OIVJY	9P7A8
V3UFI	NAPCX	5C4XY	3TYFY
12B6X	ZDT9C	JFOWK	8NZHF
IS7D7	PC3G0	26HQA	2EOL0
BJGIF	W68H3	XX7Q8	XFWUP
8TUTJ	OMB3H	COVCH	FXQVZ
PY05V	H9600	G7UPW	ZBKJO
7Z170	O7LNU	M1111	FHJY7
NSD7H	SXPYD	CCBML	ZFOCY

DS2 stays illuminated until there are only three characters remaining, at which time you can enter the next burst of text until it relights.

Code Practice

The microcontroller has a table of 600 letters and numbers in a fixed pseudo-random sequence that it sends in five-character groups. Pressing **F11** enables U2 to start at the beginning only, but the encoder sends this table repeatedly until you press the **ESC** key. Pressing the **ESC** key also restores all the defaults, including the 15 WPM code speed and sidetone, and clears all buffers. You can check your practice sessions against the five-character group listing of Table 2.

Morse Code Timing

The timing used to generate the dots, dashes and interelement spacing uses the following formulation:

T=1	Dots and space between dots and dashes
T=3	Dash and space between letters
T=7	Space between words

The value for T was adjusted so that sending the characters *PARIS* followed by a space, WPM times takes exactly one minute. You can test this by setting the speed then pressing **F10** at the same time you start a stopwatch or timer. The stopwatch should indicate exactly one minute when the encoded *PARIS* is sent WPM times, followed by a final space time and stop.

Construction Variations

Except for U1 and its associated clock and reset circuit components are not critical. This circuit includes a reed relay to control transmitter keying because the key jack on my rig presents -60 V or more, and current levels that are unknown. A relay provides isolation from this alien vacuum tube environment and possible source of RF energy. If your transmitter's keying circuit presents a low-level positive or negative voltage (20 V or less) and draws less than 20 mA, one of the optional transistor keying circuits shown can replace K1, as shown in Figure 1.

With clever repackaging, you may be able to install the keyer components inside the companion keyboard or transmitter. Placing the keyer inside the transmitter

might eliminate the need for the added 5 V power supply, some connectors and K1.

Summary

I'm sure you'll find this encoder a great way to enjoy many CW QSOs, or code practice. It's an easy to build and inexpensive project and proved to be a fun experiment for me! CU on CW!

Notes

¹A PC board for this project is available from FAR Circuits, 18N640 Field Ct, Dundee, IL 60118-9269, tel 847-836-9148 (voice and fax). Price: \$4 plus \$1.50 shipping for up to four boards. Visa and MasterCard accepted with a \$3 service charge.

A programmed S87C751-1N24 for this project is available for \$20 in US, \$24 outside US. This price includes shipping and handling by surface mail. (Source code is not

available.) While supplies last, a dc-input jack (J2) will be included with orders for the IC. Contact Ron Alspaugh, W6NKS, PO Box 1534, Grass Valley, CA 95945; tel 916-273-2022. Credit card orders are not accepted.

²More details of the Morse code character set (and other codes) can be found in *The ARRL Radio Amateur's Handbook*, pp 30.33-ff.

Ron Alspaugh received his call sign, W6NKS, in 1957, when he was licensed at age 12. He obtained a BSEE in 1974 and has worked as an analog, radio and digital engineer. Ron is a staff engineer at Tektronix Inc, where—at the Grass Valley (California) products division—he designs analog and digital video products for professional producers, broadcasters and the major networks. You'll find Ron working 40, 30 and 17 meter SSB and CW. You can reach him at 14535 Penn Rd, Grass Valley, CA 95949, and via e-mail at alspaugh@video.gvg.tek.com. **QST**

New Products

PORTABLE 40-15 METER MINI LOOP FROM MFJ

Designed for apartment dwellers and travelers, MFJ's new 1788 "Super Hi-Q Loop" is a 36-inch, high-efficiency, remotely tuned loop that transmits and receives on 40 through 15 meters. The compact antenna features a "smart" remote-control box and power supply, automatic band selection and a built-in SWR/wattmeter. The MFJ-1788 needs no counterpoise or radials, tunes its entire range with low SWR, can be mounted vertically or horizontally and handles up to 150 W of RF. Other features include all-welded construction, pushbutton tuning and a thick ABS plastic housing that's protected against sunlight and weather.

Price: \$359.95. Backed by MFJ's "no matter what" unconditional one-year warranty, the '1788 is available from your local Amateur Radio dealer or by contacting MFJ at 300 Industrial Park Rd, Starkville, MS

39759; tel 800-647-1800; fax 601-323-6551.

THE MICRO-JET TORCH FROM SOLDER IT

With its 2400° F pinpoint flame, Solder It's MJ-500 Micro-Jet Torch is perfect for coax connectors, field work, emergency repairs, heat-shrink tubing and other hobby and professional uses.

The ergonomically designed torch is fueled by refillable butane cells (included) or readily available disposable cigarette lighters. New features include a front trigger ignition and a chain-secured nozzle safety cap.



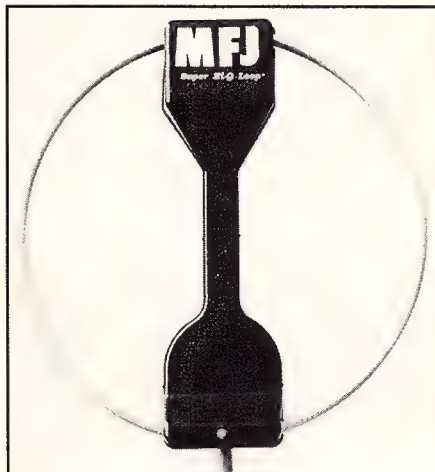
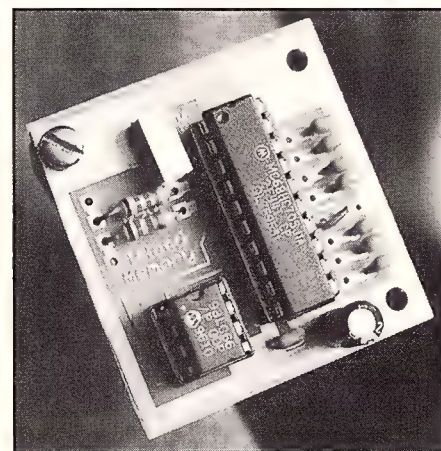
Price: \$24.95 plus \$5 s/h. VISA/MC accepted. For more information, contact Solder It, PO Box 20100, Cleveland, OH 44120; tel 800-897-8989; <http://www.solder-it.com>.

THE ISLAND MEMORY KIT

If you'd like to add memory keyer functions to your existing keyer, consider the Island Memory Kit from Jackson Harbor Press. The PC board kit uses almost no power (5 microamps on standby) and measures just 1.5 inches square. It connects to your existing keyer via five leads: power, ground, keyer output, and dit/dah paddle outputs. The unit "listens" to your keyer and records messages in one of four 60-character memories, which are retained even when power is turned off.

The kit is compatible with keyers that are powered by 3 to 6 V dc, generate dit/dah signals via a switch closure to ground, and have keyer chips that output a positive voltage (a digital "1") when sending dits/dahs.

Price: \$17.95 plus \$2 s/h (USA). Wisconsin residents add 5.5% sales tax. For more information, contact Jackson Harbor Press, N21W1418 Foss Rd, Washington Island, WI 54246; tel 414-847-2761, e-mail jacksonharbor@worldnet.att.net. **QST**



The Triple Trickler

A few dollars, a bit of spare time and you'll have an easy way to keep your batteries in top shape!

Have you ever had a hassle keeping your RV and portable-operation batteries charged? Do you have trouble remembering to fire up the trickle charger and then move it from battery to battery? That's the predicament I found myself in for the past several years. I have a large, deep-cycle lead-acid battery for my camping and Field Day radio operations, one more for the pop-up camper, and a smaller motorcycle battery that I also use for portable operations. After suffering a premature failure of one of my batteries (which I attributed to letting it become discharged over a long period of time), I decided to automate my trickle charging. Now, I just plug in a wall charger, hook up the batteries and forget about them for months at a time!

Triple Trickler Circuit

Figure 1 is a schematic of the circuit I developed to continuously cycle a single dc source from one battery to the other to keep each battery up to snuff. The system consists of a power source (in my case, a dc-output wall transformer or "wall wart"), the controller (the Trickler) and the batteries to be charged. The controller continuously switches the dc power source from one battery to the next.

The controller can be built to handle up to 10 batteries, but remember: Each battery shares an equal amount of charger time. This means that if the system is set up to service three batteries, each one gets charged *one-third* of the time. A 10-battery system allows each battery to be charged only one-tenth of the time. This may not be enough to keep the batteries fully charged.

In Figure 1, a CD4017 decade counter (U3) counts the clock pulses fed to it. Initially, the first digit (pin 3) is high. On receiving the next clock pulse, the second digit (pin 2) goes high and pin 3 goes low. On the next pulse, the third digit (pin 4) goes high, and so on, until all 10 digits are counted, then the process repeats. By using a jumper connected to U3 pin 15, the count can be controlled to set the restarting point. The other end of the jumper is connected to the U3 pin (7, 10, 1, 5, 6, 9, or 11) representing the digit that is *one higher* than the

number of batteries to be charged. For three batteries, I wanted the count to go to three, so the jumper is shown connected to the fourth digit, pin 7. (Four batteries require connection to U3 pin 10, and so on, with pin 11 representing the highest number, 11, for use with 10 batteries.)

The clock pulse to U3 is provided by the output of U2, a 555 timer. U2's output frequency is set by the time constant determined by the values of R1 and C5. With R1 at 10 M Ω and C5 at 100 μ F as shown, U3 provides an output pulse approximately every 13 minutes. This means U3 will sequence to the next digit every 13 minutes, and a complete cycle of three digits takes 39 minutes before starting over. Larger values for R1 and/or C5 will increase the length of time for each output. Electrolytic capacitors, such as C5, have a wide tolerance, so depending on the actual value of C5, the timing could vary considerably from the specified 13 minutes, but it is not at all critical.

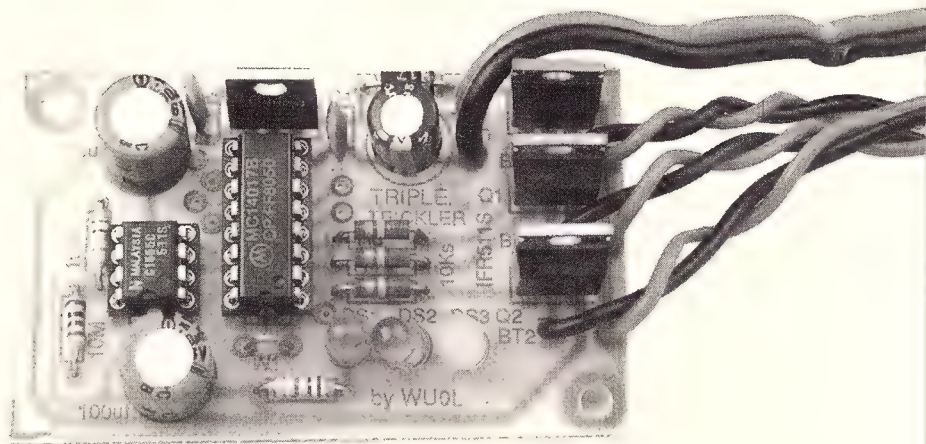
Three outputs of U3 turn on an IRF511 MOSFET (Q1, Q2 or Q3) that completes the charging circuit for each battery by providing a connection to ground. An LED (DS1, DS2 and DS3) on each of the three outputs of U3 provides a visual indication of the charging sequence. MOSFET devices have a very low turn-on resistance. Therefore, very little heat is generated by Q1 through Q3. My power supply will charge the battery at up to 500 mA when

first connected to a low battery. At this rate, the tab on an IRF511 does not even get warm to the touch and no heat sinking is necessary. At higher charge rates, it may be wise to heat-sink these devices if any sign of heating is detected. The IRF511 is rated at 3 A continuous duty.

U1 provides a constant 12 V to U2 and U3. Its main function is to protect U2 and U3 from voltages exceeding their ratings because the open-circuit power supply or wall transformer output voltage may exceed the 16 V rating of U2 and U3. D1 prevents the batteries from back-feeding the circuit if the power supply is disconnected. D1 is a Schottky diode. A Schottky is chosen to keep the forward voltage drop low. If your power supply provides plenty of voltage, an ordinary rectifier diode can be substituted. The wall charger I use has a rated output of 15 V dc at 400 mA.

Construction

The circuit can be built in most any fashion. A PC board is available,¹ but you can use perf board, too. During assembly, take



¹A PC board for this project is available from FAR Circuits, 18N640 Field Ct, Dundee, IL 60118-9269, tel 847-836-9148 (voice and fax). Price: \$4 plus \$1.50 shipping for up to four boards. Visa and MasterCard accepted with a \$3 service charge. (Visit the FAR Circuit's Web site at <http://www.cl.ais.net/farcir/> to see a catalog of other available PC boards.—Ed.)

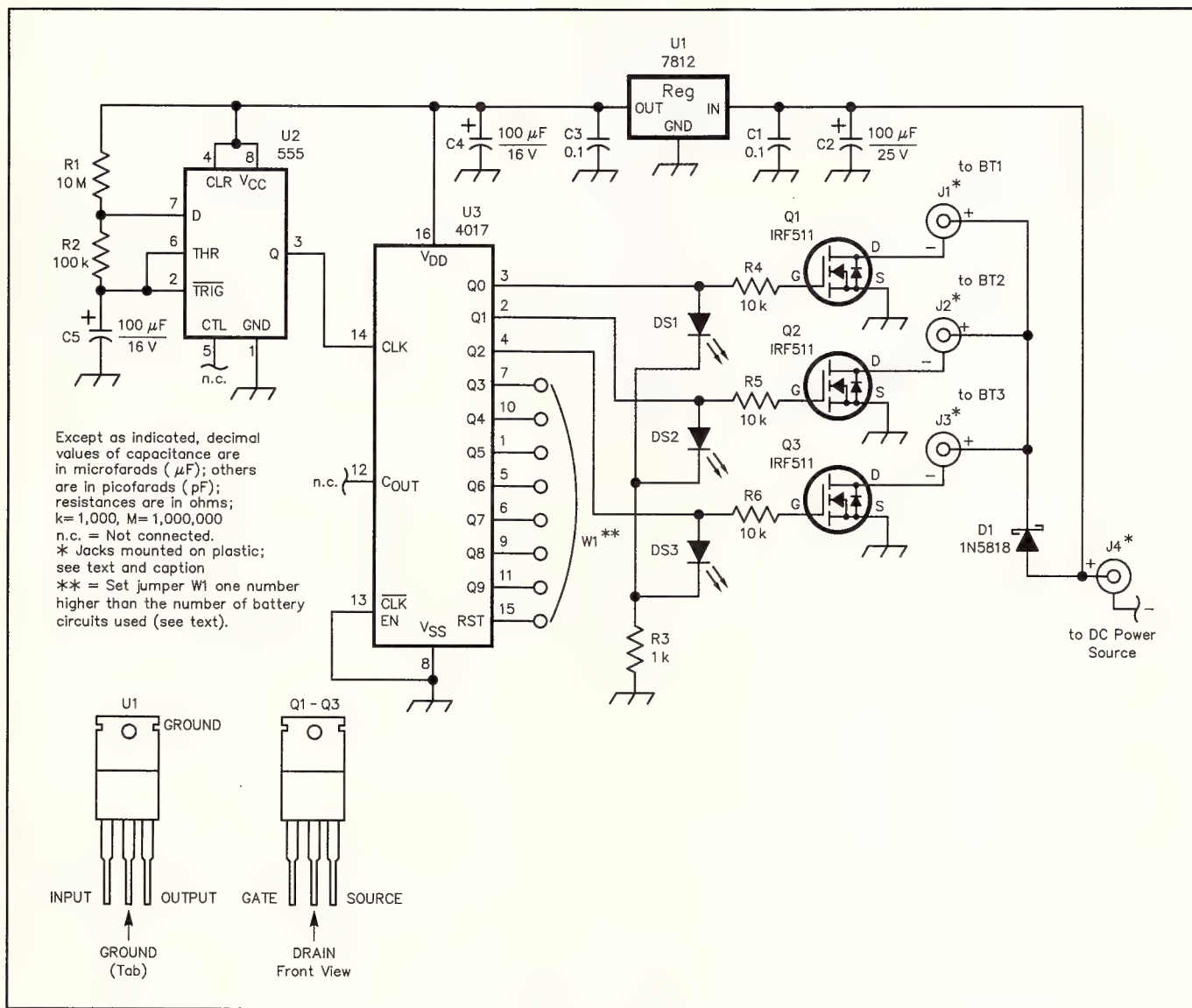


Figure 1—Schematic of the Triple Trickler circuit. J1 through J3 are insulated from ground by mounting them in a plastic box. Mating plugs connect Q1 through Q3 to their respective batteries. Part numbers in parentheses are Mouser; equivalent parts can be substituted (Mouser Electronics, 2401 Hwy 287 N, Mansfield, TX 76062, tel 800-346-6873, 817-483-4422; fax 817-483-0931 e-mail sales@mouser.com; <http://www.mouser.com>). Unless otherwise specified, resistors are $\frac{1}{4}$ W, 5% tolerance carbon-composition or film units.

C2—100 μF , 25 V (#539-SKR25V100)
C4, C5—100 μF , 16 V (#539-SKR16V100)
D1—1N5818, 1-A Schottky diode (#583-FM5818)
DS1-DS3—Small red LED (#512-MV57774C)
J1-J4—Dc power jacks, 2.5 mm ID,

5.5 mm OD (#163-4025); do not use jacks equipped with internal, normally closed switches.
P1-P4—Mating plugs (not shown) for J1-J4 (#172-4201). These plugs have pre-attached 72 inch long wires.
Q1-Q3—Power MOSFET (#333-IRF511)

U1—7812, 12 V, 1 A positive regulator (#511-L7812CP)
U2—555 timer (#511-NE555N)
U3—4017 decade counter (#511-4017BM)
Misc: enclosure (Radio Shack 270-223; see text); dc panel-mount jacks; mating dc cable plugs; hardware; wall transformer.

the usual precautions to protect Q1 through Q3 and U3 from static discharges.

The controller can be mounted in a plastic case commonly available from Radio Shack or other electronic parts suppliers. I used a plastic box with external dimensions of approximately 2 \times 3 \times 6 inches (HWD); it provides more than ample room. Coaxial power jacks and connectors attach the wall transformer to the controller and the controller to the batteries. Using a plastic enclosure ensures J1 through J3 are isolated from ground.

I made provision in my unit to be able to

charge a fourth battery (should I acquire one) by installing a fourth IRF511 (Q4) and associated circuitry (not shown in the schematic). Now, if I want to activate the fourth charging circuit, all I have to do is move the jumper from U3 pin 7 to U3 pin 10, and connect another jumper from U3 pin 7 to the junction of the added 10 k Ω resistor (R7) and LED (DS4).

Testing is easy. Using jumpers, connect a 100 k Ω resistor in parallel with R1. This decreases U1's timing cycle to 22 seconds. (This is done so you don't otherwise have to wait 13 minutes to check each clock

pulse!) Apply power from your power supply and you should see one of the LEDs light up. In approximately 22 seconds, that LED should extinguish and the next LED light up, and so forth in a continuous cycle. Then connect the batteries. With your VOM in the ammeter mode, check that each battery is getting a charging current as its associated LED lights. Then, disconnect the temporarily added 100 k Ω resistor and the unit is ready for service.

If your power supply delivers more voltage than you need, insert one or more diodes in series with the lead to the control-

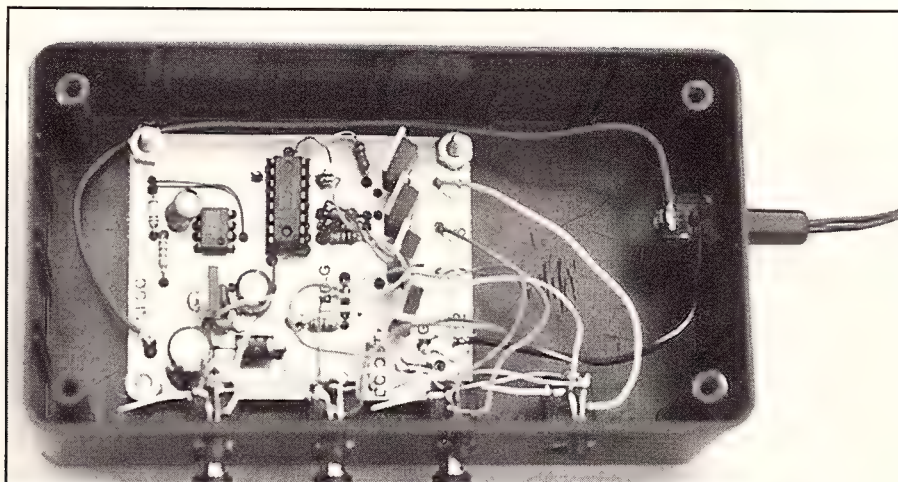


Figure 2—This inside view of the Trickler prototype shows the fourth MOSFET, LED and output connector mentioned in the text. The dc connectors on the front panel are those I had in my junk box; suitable connectors are identified in the parts list of Figure 1.

ler. Each silicon diode added provides approximately a 0.7 V drop when conducting in the forward direction. This will lower the charging current. When my batteries are in good shape, my 15 V dc wall charger

charges them at about 300 mA, and their resting voltage is about 13.5 V, which is close to optimum. If you use a wall transformer, be sure it provides a dc output. Some wall transformers deliver ac. To use

an ac-output transformer, you'll have to add a rectifier circuit.

Summary

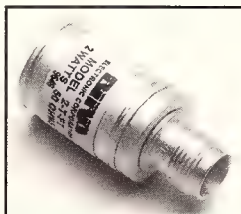
Remember: This unit should be used only for *trickle* charging. When you discharge your batteries on a field expedition, first recharge them using your regular battery charger. (Also, you may want to top them off with your standard battery charger before major usage is contemplated.) In between, however, you can rest assured that your batteries are kept in good condition by connecting them to the Trickler. My unit has been in service several months now and it is a delight! I just connect it and forget it!

Mark L. Meyer, WUØL, was first licensed in 1965 as WNØNSY when he was a high-school senior. He homebrewed his first transmitter and has been homebrewing ever since. Mark graduated with a BSEE from South Dakota School of Mines and Technology in 1970, and has worked in hydroelectric power generation and transmission since then. Mark is currently involved in the operation of the high-voltage electric grid in the western United States. You can contact him at 14153 W First Dr, Golden, CO 80401, e-mail wu0l@aol.com. **QST**

New Products

2 W AND 5 W RF LOADS FROM BIRD

◊ Bird's new T-series of RF loads—which include 2 W and 5 W models—are conservatively rated 50-ohm, air-cooled loads that perform well to 6 GHz. Manufactured with non-magnetic materials and finished in silver or tri-alloy plating, connector options include N-type, BNC and TNC. Maximum SWR is 1.25:1 from 1 to 6 GHz.



Price: 5 W, \$60; 2 W \$49. For more information, contact Bird Technologies Group, 30303 Aurora Rd, Cleveland, OH 44139; tel 216-248-1200, fax 216-248-5426, e-mail sales@bird-electronic.com.

CALL SIGN EXTENSION PLATE FROM W1TK

◊ W1TK's call sign extension plates attach to your car's license plates and are similar to those used by volunteer fire departments and other public service groups. White with black letters, the plates are 12

inches long (the same as your license plate) and extend three inches above or below your existing plate.

Price: \$10 plus \$3 S&H. ARES, RACES and club inquiries are welcome. For more information, contact Ron Wakefield, W1TK, Signs by Ron, 64 Neal Ct, MicroDyne Office, Plainville, CT 06062; tel 860-632-1070.



THE MICRO DTMF DECODER FROM OPTOELECTRONICS

◊ Compact, rugged and affordable, Optoelectronics' Micro DTMF Decoder features a 12-character LCD display, an internal mike to decode DTMF tones produced by radio or tape recorder speakers, an audio input jack, a 2000-character non-volatile memory and 100-hour operation from a single AA battery.

The Micro DTMF has three program controls (Read Data, Recall Data and Off) and two pushbuttons to scroll data. It decodes DTMF tones at up to 12.5 characters per second, measures 2.8x1.9x1.1 inches and weighs only 3 ounces.

Price: \$89. For more information, contact Optoelectronics, 5821 NE 14th Ave, Ft Lauderdale, FL 33334; tel 954-771-2050, fax 954-771-2052.

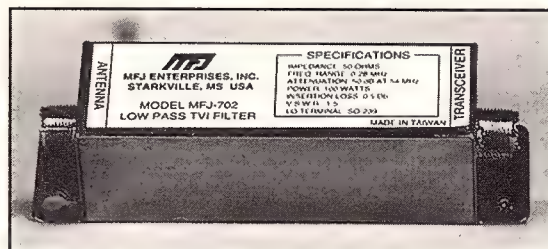
A 200-W LOW-PASS FILTER FROM MFJ

◊ With a claimed insertion loss of only 0.5 dB, MFJ's Model 702 low-pass filter will reduce transmitter harmonics above 54 MHz by up to 50 dB.

The filter's SWR is better than 1.5:1 from 1.5 through 30 MHz (in 50-Ω coaxial systems), and the compact unit (about 6 x 1 x 1.5 inches) comes with SO-239 connectors and handles up to 200 W of RF.

Price: \$24.95. Backed by MFJ's "no matter what" unconditional one-year warranty, the '702 is available from your local Amateur Radio dealer or by contacting MFJ, 300 Industrial Park Rd, Starkville, MS 39759; tel 800-647-1800; fax 601-323-6551.

QST



An Ultra-Simple Receiver For 6 Meters

Here is a simple VHF receiver you can build without any special components or test equipment.

This receiver uses superregeneration for high sensitivity and low parts count. It can receive both FM and AM modulated signals. This design differs from previous superregenerative circuits because it uses a "quench waveform" control to allow the reception of narrow-band FM. Receiver sensitivity is around 1 μ V. Builders can easily modify the radio to operate over a wide band of VHF. It is inexpensive (about \$20), can be built quite compactly and powered from a 9 or 12 V battery.

The performance of this rig does not equal that of modern commercial transceivers, but you can build it yourself and be monitoring all types of local communications in a few hours. This includes 6 meters and the adjacent frequencies. With easy modifications, you can receive police, snowplows, fire stations, telephone paging, maintenance crews, etc on VHF. This receiver is also useful for low-power wireless data links. As with any regenerative set, you will need practice and patience in learning to adjust the receiver's controls for best performance.

Regenerative Receivers

Regenerative receivers use a special type of detector that is essentially a user-controlled oscillator. In a straight regenerative circuit, the input signal couples to the detector, and some of the output signal is fed back to its input, in phase. This repeatedly amplifies the input signal. The result is very high gain in a single stage. If we allow the feedback to go past the point of oscillation, the circuit's gain stops increasing and starts decreasing, as most of the transistor's energy works to maintain the oscillation. Some type of regeneration control is necessary, so that you can keep the feedback at a point just short of oscillation. Using this technique, a single transistor or JFET can achieve circuit gains of 20,000 easily.

The superregenerative circuit uses an oscillating regenerative detector that automatically stops or "quenches" the oscilla-

tions periodically. This allows the input signal to build up to the oscillation point repeatedly, providing single-stage gains close to 1 million, even at UHF. These detectors can use two approaches for the required quenching: Either a separate lower-frequency oscillator supplies the quenching signal (*separately quenched circuitry*), or a single JFET can produce both oscillations (*a self-quenched circuit*), as shown here.

A Superregenerative Receiver for 49 to 55 MHz

The circuit shown in Figure 1 consists of an RF stage, a superregenerative detector and an audio amplifier. The common-gate RF stage, Q1, provides RF gain and helps prevent the receiver from radiating its signal out the antenna.

The detector, Q2, operates as a grounded-gate oscillator. C4 applies in-phase feedback between the JFET's source and drain. RFC2 raises Q2's source above ground (at RF) enough for oscillation to take place.

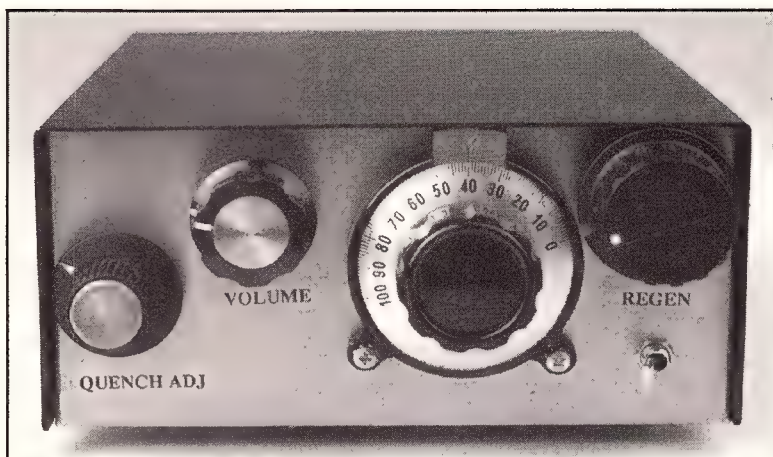
R3 provides bias for the JFET and, together with an RC network, provides the necessary quenching oscillations. The time constant set by C8A, C8B, R7 and bias resistor R3 is deliberately made long enough

so that the dc-bias level across R3 increases until it inhibits the oscillating detector. The bias voltage then discharges through the network until the bias is low enough for oscillations to start again. This creates the necessary quenching action that produces the superregenerative effect.

The received signal from the RF stage couples to the detector through a small "gimmick" capacitor made by twisting together two one-inch-long pieces of #20 AWG insulated hook-up wire. You can also use a 1 or 2 pF mica capacitor in place of the gimmick.

The detector's operating voltage is set by the 10 k Ω **REGENERATION CONTROL**. This control affects both sensitivity and selectivity. Because the detector is a modulated oscillator, it generates a double-sideband signal. Increasing regeneration (more voltage applied to the detector) increases sensitivity but also generates greater sidebands that reduce selectivity (the sidebands interfere with a narrow-band signal).

The **QUENCH-WAVEFORM-ADJUST** potentiometer, R7, adds a small resistance in series with C8 that changes the quench waveform from its normal sawtooth shape to a sine wave. A sine wave is a much



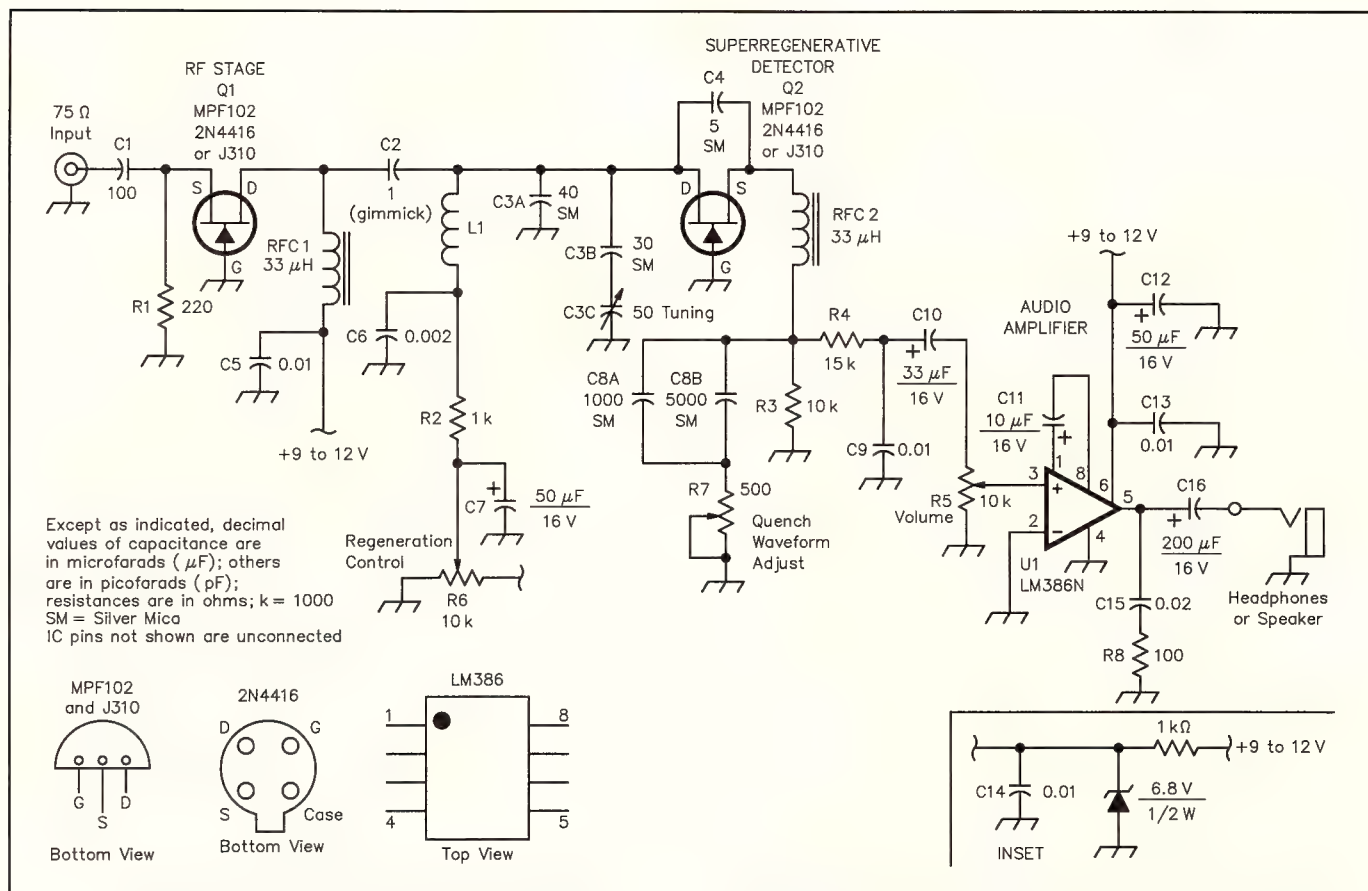


Figure 1—Schematic of the VHF receiver. Unless otherwise specified, use $\frac{1}{4}$ W, 5%-tolerance carbon composition or film resistors. Equivalent parts may be substituted. Digi-Key Corp, 701 Brooks Ave S, PO Box 677, Thief River Falls, MN 56701-0677; tel 800-344-4539 (800-DIGI-KEY), fax 218-681-3380; URL <http://www.digikey.com/>

C2—Gimmick capacitor (see text)
C3C—50 pF variable
C7, C12—50 μF , 16 V electrolytic
C10—33 μF , 16 V electrolytic

C11—10 μF , 16 V electrolytic
C16—200 μF , 16 V electrolytic
L1—7 turns, (air-core) #14 AWG solid copper wire space wound $\frac{3}{4}$ inch long on a 0.25 inch form (a pencil).

R6—10 k Ω , 10-turn pot
RFC1, RFC2—33 μH
(Digi-Key M7330-ND)

cleaner waveform (with fewer harmonics) than a sawtooth, so the sidebands are smaller and selectivity is much better. The oscilloscope photos of Figure 2 show the quenched RF envelope of the receiver with and without R7.

A simple low-pass filter (R4 and C9) removes the quench voltage from the detector's audio output. The output of the detector drives an LM386 audio-amplifier IC.

The receiver can be connected to a discone or other 75 Ω antenna via coax cable, or you can use TV twinlead cable to make a folded-dipole antenna. For a 6 meter dipole, use a nine-foot length of 300 Ω twinlead for the antenna. Solder the two wires at each end of the twinlead together, then cut one of the two twinlead wires in the center of its length. Solder the transmission line, a second piece of twinlead, to the cut ends at that point (solder two places). A good antenna greatly increases the number of narrow-band stations you can receive.

Construction

Stray circuit capacitances and multiple

ground paths can prevent the detector from oscillating. It is vitally important that the detector's tuning coil (L1) be located away from other conductive objects—particularly chassis ground, the bottom and sides of the equipment box and any other metal object.

Avoid mounting the tuning coil on a printed circuit board: This loads the detector so that it fails to oscillate properly, if at all. A hand-wired universal breadboard works fine as long as the detector coil mounts well above it, or you can just use a piece of copper-clad board and some terminal strips (ie, solder lugs). Suspend the components above the board on the lugs, or you can use the parts that have grounded leads as standoffs to hold the other components above the board. (Some call this "dead bug" or "ugly" construction.)

Put the completed circuit inside a small box or use a block of wood and a piece of metal for the front panel. If you plan to place the entire receiver inside a closed metal box, build the circuit outside the box first, and be sure it oscillates properly before placing it inside.

It is very important to mount the **TUNING** capacitor, C3C, directly onto the board and pass its shaft through an oversized hole in the front panel: Avoid mounting it directly to a metal front panel. If the capacitor's frame contacts both the front panel and the ground plane, it creates a multiple ground path (ground loop), which usually prevents the detector from oscillating. Mount all other controls directly on the front panel and connect them to the board using the shortest leads possible. Use shielded wire to connect the **VOLUME** and **QUENCH WAVEFORM ADJUST** controls to the PC board. You can connect the **REGENERATION CONTROL** to the circuitry with a twisted pair of wire leads. Connect C13 directly to U1, pin 8.

I recommend a 10-turn potentiometer for the **REGENERATION CONTROL** and a reduction drive for the **TUNING** capacitor. These make the receiver much easier to operate.

Always build receiver circuits backwards. Start with the audio stage. Build the circuitry from the speaker to the **VOLUME** control. Then test the stage by turning the

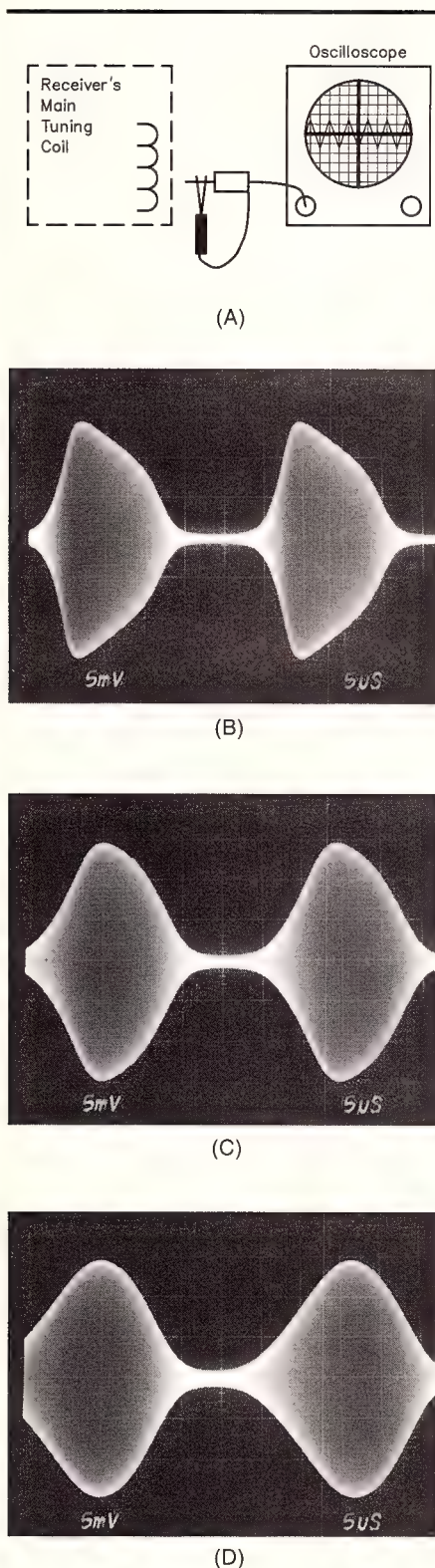


Figure 2—The effect of **QUENCH WAVEFORM ADJUST** control on the shape of the detector's oscillation waveform. A shows the test arrangement. The oscilloscope was coupled to the receiver by connecting the probe's ground clip to its tip and placing the probe tip near the receiver's main tuning coil. B, C and D show the waveforms with R7 set to 0, 250 and 500 Ω , respectively.

VOLUME control to midrange and placing your finger on the wiper (listen for a buzz). (In this test, your body serves as an antenna for the radio to pick up the noise from surrounding ac wiring. If you have no ac power, the test won't work. Then you'll need an audio signal source.—Ed.) If there's no sound, recheck the wiring or use a voltmeter to troubleshoot the problem. Be sure the supply voltage is present and that the voltage on pin 5 of the LM386 is half of the supply voltage.

After the audio stage is working, wire the detector, but leave out C2. Now, with no load on the detector, set R7 to midrange and turn-up the **REGENERATION CONTROL**, R6, until oscillation starts. (You should hear a loud rushing noise that indicates that the detector is superregenerating.)

RFC2 is the only component in the receiver that is at all critical. Since individual component layouts (and RF chokes) will vary, you may need to do some experimentation to get the detector oscillating properly. With a 5 pF value for C4 and the 33 μ H RF choke specified (Digi-Key part number M7330-ND), the detector should oscillate strongly. If it doesn't, check the wiring very carefully. If the wiring is okay, try changing the value of the RF choke.

Here's how to do it with an RS 273-102C RFC: First, unsolder one end of the choke winding from its lead. Remove (unwind) about 15 turns. Connect this unwound end to Q2's source and the other end to the junction of R3 and R4. Switch the radio on. Does it oscillate? If not, unwind more turns with the set operating, a few at a time, until there's a strong oscillation. Then, kill the power. Bend the coil's free end over to its lead, solder it in place and cut-off the extra wire. Connect the lead to Q2 and do a final test.

Miscellaneous

For optimum sensitivity from this receiver, use a fresh battery. A 9 V transistor radio battery is fine for portable use. Two series-connected 6 V lantern batteries will operate this receiver for many months.

You can expand or reduce the receiver's tuning range by varying the values of C3A and C3B. C3B sets the total tuning range, so you can use different values of tuning capacitor other than the 50 pF specified. Make C3A's value greater to lower the tuning range. Likewise, you can compress or expand the turns on the main tuning coil for the same effect.

Operation

For the best performance, this receiver needs to have its regeneration level reset every time its tuning changes. The **REGENERATION CONTROL** changes the voltage that powers the detector. Higher detector voltages increase sensitivity but they broaden the selectivity.

In these self-quenched circuits, the **REGENERATION CONTROL** also varies the

quench frequency. For AM and wide-band FM reception, set R7 (**QUENCH WAVEFORM ADJUST**) for minimum resistance and simply increase the **REGENERATION CONTROL** past the detector's oscillation threshold to a point where the background (mush) noise suddenly begins to increase rapidly. Then decrease the **REGENERATION CONTROL** setting slightly.

For narrow-band FM reception, set R7 (**QUENCH WAVEFORM ADJUST**) at mid-scale, adjust the **REGENERATION CONTROL** for strong oscillation (high sensitivity) and tune in the carrier of the desired station. After tuning to the center frequency of the carrier, decrease the regeneration level until the audio level increases sharply. (If you decrease the level too much, the detector will squeal.) Adjusting R7 (**QUENCH WAVEFORM ADJUST**) creates a narrow-band window on the **REGENERATION CONTROL** between the point where the detector first begins to oscillate and the point where (narrow-band) audio begins to drop off rapidly. Increasing R7's resistance widens this region but decreases detector sensitivity. Because of their interaction, the **REGENERATION CONTROL** and the **QUENCH WAVEFORM ADJUST** control need repeated adjustment for narrow-band FM reception.

You can copy CW and SSB with this receiver. Set the **REGENERATION CONTROL** to a low point, where the detector stops superregenerating, but where it is still oscillating. The receiver now operates as a straight regenerative set.

You can easily convert this receiver to operate on other bands. For 2 meters, make the following component changes: Omit C8A and C3A, change C3B to approximately 15 pF, change C3C to a 25 pF variable capacitor, change C4 to 2 pF, and change RFC1 and RFC2 to 15 μ H; L1 is 3 turns, 1 inch long. Add a 1 k Ω resistor and 6.8 V Zener diode before the **REGENERATION CONTROL** (see Figure 1 inset) for increased stability on the higher bands, but that's not needed at 6 meters.

Charles Kitchin is a hardware applications engineer at Analog Devices Semiconductor Division in Wilmington, Massachusetts, where he has been employed for the past 21 years. His main responsibilities include customer applications support and writing technical publications such as application notes and data sheets. He has published over 50 technical articles and two applications booklets. Chuck graduated with an ASET from Wentworth Institute in Boston, and afterward spent many years studying electrical engineering at the University of Lowell's evening division. Chuck has been an avid radio builder and shortwave listener since childhood and a licensed radio amateur (Tech Plus) for two years. His other hobbies include astronomy, beer brewing and oil painting. You can reach Chuck at 804 Woburn St, Wilmington, MA 01887; tel 781-937-1665, fax 781-937-2019; e-mail Charles.Kitchin@analog.com.

QST

SAREX: Looking for Tomorrow's Scientists Today

It's an early 6 AM on September 22, 1996, and a crowd of more than 200 people is gathered in Andover Middle School's cafeteria to watch students talk to an astronaut. School-age kids are thrilled by these encounters, but today's event is truly out of this world. Instead of hosting a NASA presentation in the gym, this astronaut is orbiting the Earth in a space shuttle! The experience is part of the ongoing "Shuttle Amateur Radio Experiment," better known as SAREX.

A deep voice advises, "On the mark, it will be 6:15 ... mark!" Nervous eyes glance at watches. Attendees, many who have limited knowledge of Amateur Radio, sit quietly, eyes fixed on an array of radio equipment and a line of waiting students. We know something wonderful is about to happen!

"N5QWL, N5QWL, N5QWL," comes the voice from NASA's South Africa control center—and then the reply ... "This is N5QWL." From his space shuttle, orbiting several hundred miles above the Earth's surface, astronaut Jay Apt, N5QWL, is chatting with Andover's kids ...

By the time our school's segment was over, some 20 student questions were asked and answered. Students, parents, patrons, media representatives and ham operators shook hands, patted each other on the back and shared some tears and hugs of excitement and relief. The Andover Middle School SAREX contact with Jay Apt, aboard the space shuttle *Atlantis*, mission STS-79, was a smashing success.

Through the remainder of the school year, my middle school students and I reminisced about our special September morning. We shared the excitement of being photographed, having stories written about us and being in the limelight. But just as September fall leaves change color, our Amateur Radio focus changed directions.

Instead of preparing for another SAREX contact, we had new goals of building QRP kits, operating via slow-scan television and improving our Morse code skills for Field Day '97.

Mid-April arrived and found an excited bunch of students preparing for spring

As these Kansas students will discover, the Shuttle Amateur Radio Experiment, one of ham radio's premier youth programs, is not only larger than life—it can *change* lives. Tomorrow's astronaut corps will certainly include SAREX participants...perhaps one or two from this Midwestern town.



Jay, students and parents on their way to a special pizza party lunch.

break. As members of the ham radio class sat in the cafeteria enjoying birthday treats, a colleague tapped me on the shoulder and whispered, "Missy, you have an important phone call in the office."

I left my co-worker to watch over the class and hurried to the school office. The school secretary looked at me with bewildered eyes and remarked, "Missy, someone from NASA would like to talk to you."

"Yeah, right," I replied.

"Missy, it's really NASA."

Nervously, I picked up the phone.

"Umm....Hello? This is Missy."

The next thing I knew was that Jay Apt, N5QWL, the astronaut my students talked to during the *Atlantis* mission, was going to spend the day with us on May 16. My students had a new mission: to make May 16 a memorable "Jay Apt Day" in Andover, Kansas!

Preparations

As we met to discuss preparations, our task list included: securing the funds to pay for Jay's expenses; asking Andover's

mayor to proclaim May 16, 1997, as "Jay Apt Day"; contacting parent volunteer groups for assembly decorations; planning and developing student activities; providing meaningful gifts for Jay; notifying local news outlets; and asking local businesses to change their signs to read, "Welcome Jay Apt."

At the suggestion of Dr Linda Hope, the school principal, I contacted our vending machine provider to "cash in" our Coca-Cola Edu-credits, a fund designed for student activities. Additionally, Andover Mayor Dennis Bush assured us that the town's Commerce and Tourism committee would handle the remaining expenses. Mayor Bush would be at the assembly to make the proclamation in person, and to present Jay with a special "key to the city" made just for the occasion.

The parent volunteers chose a patriotic theme for event decorations that included red, white and blue balloons and streamers. Additionally, the volunteers contacted NASA for Jay Apt promotional materials.

Because the end of the school year



Astronaut Jay Apt, N5QWL, meets the students he chatted with during his *Atlantis* mission.

would soon be upon us, we wanted a light and fun approach to preparing the student body for the event. During morning announcements, for example, NASA/Jay Apt trivia facts were announced. And home-room teachers shared Jay's NASA biographical information with their students. As the important date approached, classes worked as teams to answer as many trivia questions as they could. Prizes (cans of soda) were awarded to the winning classes.

The students decorated posters to greet Jay as he arrived at the school. Some posters, drawn by science students, depicted the fine details of a space shuttle. Others, on the humorous side, showed Jay shaking hands with a variety of well-drawn aliens.

To complement the mayor's "key to the city," the students put together a personal scrapbook entitled, *Jay Apt, This is Your Life!* which was developed by student artists and written and illustrated for Jay's young daughters' enjoyment. Not to be outdone, the ham radio students thought Jay needed a new Amateur Radio cap, so they gave him a flashy Hawaiian print cap personalized with "JAY N5QWL" in bold blue letters.

Incoming Astronaut!

The big day finally arrived, and fellow teacher Kurtis Boughton, NØUGJ, shared the excitement with me as we drove to the airport to pick up our guest. Jay, an avid pilot, chose to fly his Beechcraft *Bonanza*. Casually dressed in jeans, Jay carried a small knapsack and a laptop computer. "Missy," he reassured, "don't worry. I've packed my blue flight suit."

Jay's schedule was hectic as he toured our school's technology lab, Amateur Radio classroom and building facilities. His first task was to teach the Introduction to Amateur Radio class about radio wave propagation. Jay's "pupils" included 20 middle school students, a group of local hams—and a bunch of reporters!

A short while later, a class of Andover

SAREX Resources

If you'd like to participate in a future SAREX mission, whether as a school teacher or technical helper, call the ARRL's Educational Activities Department at 860-594-0301, or point your Web browser to <http://www.arrl.org/sarex/>, HQ's informative SAREX Web site.

Because future shuttle missions will mainly be dedicated to bringing parts of the International Space Station *Freedom* into space, there will likely be only one SAREX mission in 1998, and one in 1999. Details on any possible SAREX missions will be posted on the SAREX Web page as soon as they become available. (When *Freedom* is orbiting and operational, opportunities for astronaut/student contacts will increase dramatically.)

second-graders, taught by Carol Musick, KBØONM, talked with Jay via the local El Dorado repeater (WØRGB). The 10-minute contact was filled with a variety of questions, including the traditional "How do you go to the bathroom?" query.

Next stop? Lunch! Jay was whisked off to a school bus with the nine students who had talked to him during the STS-79 mission. The destination was Andover's Big Cheese Pizza for the all-you-can-eat noon buffet. While the students wolfed down stacks of pepperoni and supreme pizza slices, Jay went from table to table, talking with each student (which probably helped to keep his trim astronaut waistline!).

Jay's concluding task was the grand finale: addressing the middle school assembly. As the auditorium filled with nearly 700 students, I quickly prayed that everyone would behave properly. (After all, it was the end of the school year, and some students had already decided that the year had been over for a few weeks!)

As the house lights were lowered, I was left on the stage amidst helium-filled red, white, and blue balloons. After my eyes adjusted to the spotlights, I glanced around the auditorium. Everybody who had supported our school's Amateur Radio program was there: my husband, Fred Hollenbeck, NØWSA; my dad, Gary Hoffsommer, WØTI; numerous ham radio friends; students; parents; community members; teachers; and school administrators.

A hush fell across the auditorium as I gingerly turned on the microphone.

"Five years ago," I began, "a small group of students and I had a dream. The dream was to explore technology by the means of an Amateur Radio club. Little did we know that forming our charter club would lead to today's celebration.

"The club would not exist today without the help of some very special people. 'We need equipment!' was our call, and Ronald and Martha Robb [WDØBOC, KAØPCE] answered, believing in the students and me. They donated top-notch Amateur Radio equipment to start our school club. Ronald and Martha, this celebration today is happening because you care about kids. Thank you.

"We also have some other special guests in the audience today: members of the Flint Hills Amateur Radio Club, the Wichita Amateur Radio Club, and the Boeing Employees' Amateur Radio Society. These people have supported our club's mission from the very beginning.

"On September 22, 1996, a crowd of more than 200 people gathered in the school cafeteria to experience the 'Shuttle Amateur Radio Experiment,' better known as SAREX. Excitement filled the airwaves as our scheduled time arrived to talk to an astronaut aboard the space shuttle *Atlantis*.

"After more than 20 student questions were asked and answered, we honestly thought that the event was a part of history. Little did we know that the SAREX event was only the beginning.

"Today, I proudly present to you the astronaut that we talked to on that memorable day in September. Ladies and gentlemen, a real American hero, astronaut Jay Apt, N5QWL!"

Tears welled up in my eyes as Jay, dressed in his blue flight suit, proudly walked out on the stage, shook my hand, and received his gifts from the city and students. As video cameras rolled, camera flashes sparkled and students enthusiastically clapped, I knew that today's events would make a difference in so many students' lives. We might not notice the changes today, but someday, thanks to the clarity of hindsight, the marks made by SAREX and Andover's day with Jay Apt will be crystal clear.

Michelle Hollenbeck, AAØOP, is a teacher at Andover Middle School, 1628 N Andover Rd, Andover, KS 67002, e-mail aa0of@feist.com; <http://www.feist.com/~aa0of>

All photos by the author.

QST

The Digital Audio Radio Service

With FCC licenses in hand, two companies are racing to deliver nationwide, CD-quality music and talk programming to your car radio via satellite. While DARS will almost certainly revolutionize car audio, forward-thinking hams may well wonder whether this innovative technology will one day enhance the Amateur Radio service. This article, a follow-up to *QST*'s May 1994 "A Look at Digital Audio Broadcasting," highlights recent developments and looks to the future of digital radio.

From the first vibrator-powered tube radios of the 1930s, to today's microprocessor-controlled miniature marvels, car audio has remained fundamentally unchanged. We've come a long way since those early, temperamental vacuum-tube jobs, but—CD players, cassette tapes and thumping subwoofers aside—radio is still radio.

Drivers still ease the frustration of traffic jams by tuning to their favorite local stations—AM or FM. Whether beautiful music, top 40, album rock, country western, all sports, all talk or all shock, drivers choose whatever's on the local media menu.

More than 10,000 local stations across the country offer programming to listeners in a free market system of supply and demand, supported by advertisers paying to reach numerous listening audiences.

A number of national networks furnish a measure of programming consistency from coast to coast, but the stations them-

selves provide only local or regional coverage. Thanks to recent action by the FCC, however, this venerable era in broadcasting history will soon come to an end. Before the end of this century, "pay for play" satellite radio will compete with local radio stations for mobile listeners.

Woody by high-fidelity, commercial-free specialty programming—with consistent nationwide coverage—the drivers of America's 200 million cars and trucks will enjoy unprecedented listening opportunities.

DARS, the digital audio radio service, the FCC's official name for "high-fidelity satellite radio," has endured more than seven years of development, politics and financial maneuvering. In a little more than a year it will be as real as cable TV—and perhaps as influential.

The Road to DARS

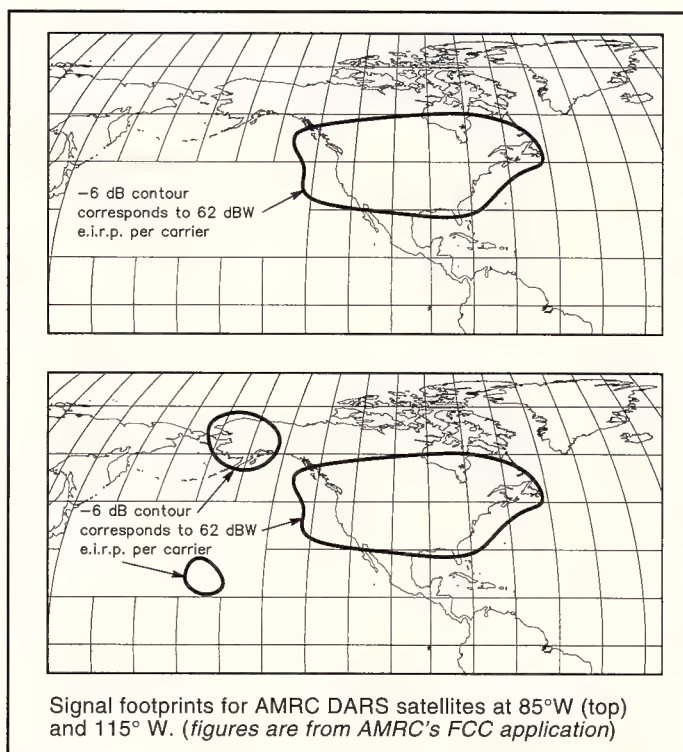
On April 2, 1997, the FCC gave the final go-ahead to two competing companies to

begin the process of taking DARS from a technically feasible proposition to an "in your dashboard" reality.

Over the past few years, as many as four companies sought to obtain one of the two DARS licenses to be awarded by the Commission. In the end—and after a harrowing 26-round, two-day spectrum auction in Washington, DC—CD Radio Inc and American Mobile Radio Corporation walked away as the winners.

CD Radio, based in Washington, DC (but moving to New York City), bid \$83.3 million for the first license. AMRC, of Reston, Virginia, a subsidiary of wireless giant American Mobile Satellite Corporation, paid \$89.9 million to capture the second and final license. Two other contenders, Digital Satellite Broadcasting Corporation and Primosphere Limited Partnership, did not make the final cut.

The same technological advances in microelectronics and digital transmission



systems that made "mini dish" satellite TV systems possible have been available for DARS for several years. Implementation of satellite radio, however, has been slowed mostly by politics and industry lobbying.

The National Association of Broadcasters argued that satellite-delivered pay radio would siphon ad dollars from conventional local stations. Although space-based digital radio was inevitable, the NAB and other agents managed to delay introduction of the service until the turn of the century, when terrestrial digital radio begins its march to eventually replace traditional analog AM and FM broadcasts.

"Pay radio and local broadcast radio are totally compatible," says CD Radio founder and CEO David Margoese, one of the earliest DARS proponents. "What we're about to experience is very similar to the early days of cable TV. But today, the pervasiveness of cable systems is taken for granted, and local TV stations are still flourishing. In broadcasting, technology offers better performance and more variety, but there will always be a need for locally produced programming."

AMRC President Lon Levin agrees. "Just because you watch movies on pay TV doesn't mean that you abandon local stations for news, information, local on-air personalities and your favorite sitcoms. It will be the same with satellite radio. The two will coexist peacefully."

System Overview

Each DARS provider will use a pair of high-power geosynchronous satellites to deliver programming to the continental US, and each has a 12.5-MHz slice of the 25-MHz DARS frequency allocation at 2.320–2.345 GHz.

Earth-based receivers (mobile and fixed) will be compact (the mobile antenna is the size of a silver dollar) and interoperable. That is, DARS decoders, whether stand-alone or built into your car radio or home stereo, must be able to receive programming from both providers.

Expect digital electronics and powerful software to make that happen, as CD Radio's system uses spread-spectrum CDMA modulation, while AMRC will likely transmit fewer channels via more conventional TDMA methods. Receivers "listen" to both satellites simultaneously (like hand-held GPS receivers), but seamlessly switch between individual satellites to lock in the best signal.

Programming subscription fees will range from \$5 to \$10 per month, and will tend to decrease as the number of users increases. Initially, DARS decoders (stand-alone and built in) will increase the cost of car audio by about \$150. To get things off the ground, both companies need to raise about \$500 million each to pay for satellite construction, launch fees and uplink/programming centers. Each company is well on its way financially.



If you have a cassette player in your car, this adapter will add satellite radio!

Domestically, previous users of spectrum at 2.3 GHz, mostly aeronautical telemetry licensees, have been accommodated elsewhere. With Canada and Mexico, which may experience interference problems to telemetry systems located near US borders, DARS providers must take reasonable steps to minimize or eliminate problems that may arise. Most countries have chosen to license DARS-type broadcasting in the 1452–1492 MHz band. At 2.3 GHz, the US DARS allocation is an exception shared only by India.

DARS Technology

While there are potentially significant differences between the two DARS providers when it comes to program offerings, CD Radio and AMRC will use similar systems in the hardware department.

Satellite Systems

Loral's FS-1300 satellite chassis will serve as the space platform for CD Radio's system. There are 24 FS-1300s in production (with 61 on order), making the three-axis stabilized Loral system mature and quite popular.

With a healthy 2-kW transmitter output power and high-gain antennas, CD Radio's satellites will put out nearly a megawatt of effective radiated power, more than enough to overcome the considerable satellite-to-Earth path loss and blanket the lower 48 states with a signal that can be received with the company's miniature mobile antennas.

Loral will build two orbiting DARS birds for CD Radio and a third ground-

based spare. Launch dates are set for August and November of 1999, and if all goes well, the FS-1300s will end up in orbital slots at 80° W and 110° W.

According to AMRC's FCC application, its satellite system is tentatively based on the Hughes HS-702 chassis, a three-axis stabilized bird that will cover the lower 48 (and Alaska and Hawaii) with an impressive megawatt-plus effective radiated power. With orbital slots of 85° W and 115° W, the two Hughes sats are scheduled to launch in late 1999 and early 2000.

Hughes is a major AMRC/AMSC partner, as is WorldSpace, a Washington, DC, technology company that is leading the push for worldwide satellite-based international broadcasting—a potential evolutionary step for today's shortwave broadcasters.

Digital Compression

To pack so much programming into a relatively small 12.5-MHz bandwidth, both DARS providers use advanced digital transmission (and encryption) techniques to compress and protect their signals.

CD Radio uses AT&T/Lucent's perceptual audio coding system (PAC), which has also been chosen by USA Digital for future Earth-based digital radio systems. PAC takes the normal 1.44 Mbit/s CD-quality digital audio data stream and compresses it to a manageable 128 kbit/s (a 12:1 ratio).

AMRC's compression scheme is based on a dynamically allocated MPEG Audio Layer 3 system that compresses source audio from 12:1 (128 kbit/s for CD-quality sound) to 48:1 (16 kbit/s for "better than shortwave" quality sound). Using its multichannel TDMA modulation system, AMRC's control center can dynamically allocate channel resources and compression ratios to accommodate various program sources and quality levels.

Receivers/Car Audio

The satellite technology used by DARS is notable—but the receiver and decoder systems that will end up in your car (or your mobile VHF/UHF rig?) will impress even the most jaded techno-junkies.

Both providers will offer add-ons that let drivers receive DARS programming through their existing car stereos, and both are working with manufacturers to provide built-in OEM AM/FM/cassette/DARS receivers. By the time DARS is operational

Selected DARS Hardware and Performance Specifications

Specification	CD Radio	AMRC
Satellite Chassis	Loral FS-1300	Hughes HS-702 (tentative)
Type	3-axis stabilized	3-axis stabilized
Power Output	60 dBW EIRP	62 dBW EIRP
Mission Life	15 years	15 years
Orbital Position	80° and 110° W	85° and 110° W
Modulation Method	Synchronous CDMA	TDMA
Digital Compression	AT&T/Lucent PAC	MPEG Audio Layer 3
Uplink Freqs	7.025 – 7.075 GHz	7.025 – 7.075 GHz
Downlink Freqs	2320 – 2332.5 MHz	2332.5 – 2345 MHz

you'll be able to purchase receivers and adapters at local retailers.

And both providers will feature decoders that have unique digital IDs, much like today's satellite TV and pay-per-view systems.

The really fun stuff, however, involves the hardware and techniques used to provide users with easy, affordable access to the new satellite service.

CD Radio co-founder and technology guru Rob Briskman developed (and is patenting) many of the system's most elegant components, including the silver-dollar-size antenna that sticks on your car's rear window.

The small, thin, planar array, sometimes called a "patch antenna," contains a lot of high-tech goodies, including the receiving antenna itself, a solar battery charger, a battery, a 2.3 GHz-to-900 MHz "block downconverter," a 1-microwatt 900-MHz

transmitter and a 900-MHz loop antenna (located on the underside of the disc).

To eliminate the need for running signal and power leads to the mini antenna, the solar-charged system receives the digital data stream from the satellites, converts it (without demodulating the signals) to a frequency in the 900-MHz ISM band and re-transmits the data to the receiver/decoder.

If your car has an in-dash DARS-compatible receiver, its built-in 900-MHz data module receives the flea-power signal from the patch antenna/converter, translates the digital music back to analog audio and passes it to your stereo's audio amplifier. You hear only the CD-quality audio. There are no wires to run here, there or anywhere.

Thanks to an unusual, elegant engineering solution, users without OEM DARS-compatible radios aren't left out in the cold. If you have a cassette player in your car radio, you're only seconds away from sat-

ellite radio.

Briskman's cassette adapter provides the magic link. Hiding inside a conventional-looking cassette housing is a 900-MHz receiver/decoder, a battery, a power generator and a high-fidelity "tape-head magnetic transmitter."

When it's time to listen to DARS, simply insert the CD Radio "cassette," push a channel-select button or two and away you go. The adapter receives and decodes the 900-MHz data stream from the patch antenna's low-power translator and passes it to the magnetic transducer that's now adjacent to your tape deck's own magnetic heads.

Your car radio thinks it's playing a tape and you hear high-fidelity DARS audio through your speakers. My favorite part of this amazing system is the micro-size electric generator (and battery charger) *inside the cassette adapter* that's powered by the tape deck's capstan drive (the rubber drive wheel that normally moves the tape past the magnetic heads)!

The internal battery is really only needed to provide "instant on" capability when the unit is first inserted, eliminating the 1-second delay before the internal generator gets up to speed. Again—no wires required!

Although it may never be manufactured because in-dash CD players are widely being replaced by in-trunk, multi-CD changers, Briskman developed a similar adapter for CD players that translates the 900-MHz signals from the patch antenna to a flashing (modulated) light beam that is compatible with the CD player's own laser decoder!

High-powered satellites aside, the innovations used by Briskman's wireless systems should garner respect from even the most revered ham radio technologists. This stuff, should hams adapt it to their own purposes, could be very interesting!

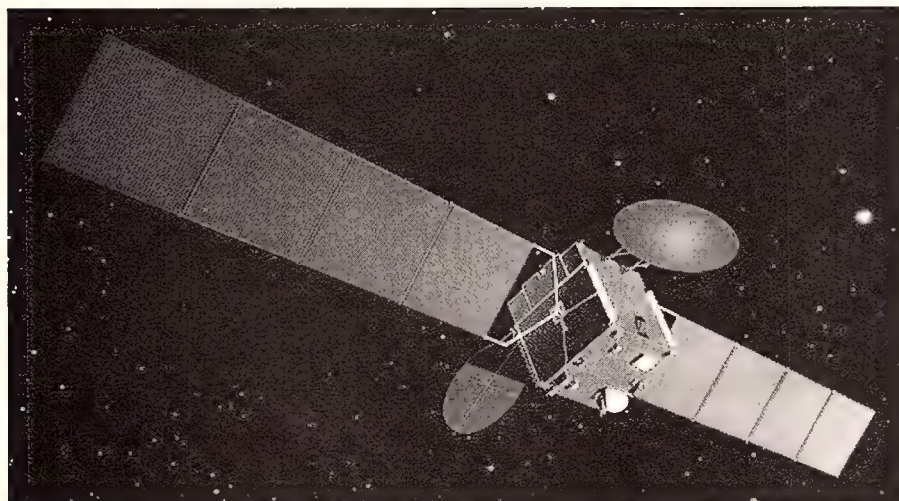
Margolese says CD Radio's complete system (cassette adapter, patch antenna and all batteries, manuals, program guides, etc) will retail for about \$150. Simply take your kit home, stick the antenna on the rear window of your car, plug the cassette adapter into your tape deck and dial CD Radio's convenient 800 telephone number (from your satellite cell phone, perhaps?).

You can set up your account over the phone, and when you provide your unit's digital ID number to the customer service rep, your satellite radio system will "authorize," and in a matter of minutes you'll be up and running.

Decisions haven't been finalized, but Briskman says the technology may be licensed to other manufacturers.

Programming

Although program providers and channel lineups haven't yet been determined, AMRC's DARS system appears to be flexible enough to accommodate many program providers using multiple uplink methods. This should allow AMRC to pick and



An "artist's eye view" of CD Radio's Loral FS-1300 DARS satellite.

What's on the Radio?

Initial music programming from CD Radio's Satellite Broadcast Center (these 30 CD-quality music channels will be in stereo; an additional 20 channels of talk, sports and news will be broadcast at reduced fidelity. Although the lineup of non-music providers hasn't been finalized, look for potentially interesting offerings such as the BBC or other powerhouse international broadcasters).

Channel	Programming	Channel	Programming
1	Symphonic	16	Latin Rhythms
2	Chamber Music	17	Reggae
3	Opera	18	Hip-Hop and Rap
4	Today's Country	19	Dance
5	Traditional Country	20	Urban Contemporary
6	Contemporary Jazz	21	Soft Rock
7	Classic Jazz	22	Singers and Songs
8	Blues	23	Beautiful Music
9	Big Band	24	Album Rock
10	Top of the Charts	25	Alternative Rock
11	Classic Rock	26	New Age
12	'50s Oldies	27	Broadway's Best
13	'60s Oldies	28	Gospel
14	Folk Rock	29	Children's Entertainment
15	Latin Ballads	30	World Beat

choose among existing program providers if the company decides not to produce its own content.

CD Radio, on the other hand, will definitely provide its own programming. The company is building a large uplink center in New York City—a large music programming operation under one roof.

"Think of it as 50 radio stations in one facility," says Margolese, who is quick to point out that CD Radio "is a media company that happens to use satellite technology to deliver its content. We're not a primarily satellite company." See the sidebar, "What's on the Radio?" for more information.

Marketing

Margolese and Levin are both confident that the market for DARS will be large enough to allow both companies to prosper. According to a May 19, 1997, article in the *Washington Post*, satellite industry analysts are optimistic about the future of DARS and its financial viability.

One analyst estimates that CD Radio alone should have 7.5 million subscribers generating more than \$600 million in annual revenue by 2003. The convenience and relatively low cost to obtain DARS access

DARS Resources on the Internet

Because the details of DARS and its implementation change almost daily, the internet is the best place to find the latest scoop. CD Radio's corporate home page at <http://www.cdradio.com> is a good place to start. There is also material available at the FCC homepage, <http://www.fcc.gov/>, and <http://www.skycell.com/>, the homepage of AMRC's parent company.

is of particular benefit—especially to the owners of the 15 million new cars purchased in the US each year—and to the 5 million drivers who buy new car audio components each year.

There are potential problems, however. Satellite and launch failures have produced setbacks for several recent ventures. And if the two DARS providers end up subsidizing hardware (radio/adaptor) manufacturers, as do "mini-dish" satellite TV providers, cash flow might be tight, especially at the outset.

Prices: Standard Model, \$23 (for solid-state rigs keyed via COM or LPT ports); Universal Model, \$35 (keys any solid-state or tube-type rig via an LPT port). For more information, contact Jack Schuster, WIWEE, 408 Thompson St, Glastonbury, CT 06033; tel 860-633-2756.

QST-

New Products

TJ ANTENNA COMPANY MOVES TO NEW MEXICO

◇ The BB3 Mobile HF Antenna, formerly manufactured by TJ Antenna Company of Hermiston, Oregon, is now being marketed and supported by Nott Ltd of Farmington, New Mexico, a manufacturer of antennas and hardware for the broadcasting industry.

Sales and technical inquiries should be directed to Nott Ltd, 4001 La Plata Hwy, Farmington, NM 87401; tel 505-327-5646, fax 505-325-1142, e-mail 102640.3503@compuserve.com.

Tom Wilson, KA7W, the BB3's designer, has moved to Farmington and will be closely associated with Nott and the antenna's further development. The rugged mobile antenna continuously covers 1.8 to 30 MHz.

COMPUTER CW INTERFACES FROM WIWEE

◇ Compatible with popular computer contest logging programs such as *CT*, *NA* and *N6TR LOG*, WIWEE CW interfaces are available for every solid state or tube-type transmitter/transceiver. The circuitry is neatly packaged inside the connector that plugs into your IBM-compatible computer. A built-in phono jack accepts a user-provided cable to key your rig.

QEX:

The ARRL Experimenter's Exchange

The November issue of *QEX* includes:

For microwave enthusiasts, Paul Wade, N1BWT, describes a single-board transverter for 5760 MHz. It's not a "no-tune" design, but pipe-cap filters and newly available MMICs provide good performance in a reasonable project.

For those of you deeply into data transmission modes, Ken Wickwire, KB1JY, goes over a software package for analyzing channel and station performance data from HAL CLOVER modems.

In line with our desire to provide simple projects along with more advanced material, Bill Latta, N4LH, shows us how to build very simple receivers using an inexpensive IC developed for AM broadcast receivers. He shows how to adapt these ICs for 80/75 m operation.

Zack Lau, W1VT, is back this month with the RF column. This time he provides the dope on a VHF local oscillator for KK7B's 23 cm no-tune transverter. As usual, his column is informative and thought provoking.

QEX is edited by Rudy Severns, N6LF,

Digital Radio's Future

There's no doubt that digital radio is here to stay, terrestrially and from space. The benefits in signal quality, programming variety, spectrum utilization and reduced circuit complexity (eventually) are too compelling to ignore.

In these early years, CD Radio and American Mobile Radio Corporation will compete and cooperate in making DARS a household name and household technology. While they work out the details, we drivers will reap the amazing benefits of satellite radio.

As a ham, it's interesting to wonder whether Amateur Radio will ever adapt satellite-based systems that take advantage of uniquely addressable receivers, miniature solar-powered translators, or satellite antenna/receivers that are small enough to fit on a hand-held radio!

As always, it's out with the old, in with the new. Now, if DARS had a Stevie Ray Vaughan "Texas Blues" channel ...

The author, a ham since age 13, was a QST editor from 1988 through 1994. He now lives in Minnesota's lake country where he works as a technical writing/technical marketing consultant and freelance writer. He's a regular contributor to QST.

QST-

(e-mail rseverns@arrrl.org) and is published monthly. Subscription rate (12 issues) for ARRL members is: US, \$15; Canada, Mexico and US by First Class mail, \$28; elsewhere by airmail, \$48 or by surface mail (4-8 week delivery), \$20. Nonmembers add \$12 to these rates.

Would you like to write for *QEX*? It pays \$50/printed page. Get more information and an *Author's Guide* at: <http://www.arrrl.org/writing.html>. If you prefer "snail mail," send an SASE (6×9 inches, minimum) with 55¢ postage to Maty Weinberg, ARRL, 225 Main St, Newington, CT 06111-1494, and request an *Author's Guide*.

Strays

I would like to get in touch with...

◇ I would like to hear from anyone who has modified an MFJ-989C antenna tuner by adding vernier control knobs to the capacitors and a mechanical gear-type turns counter in place of the rubber band control for the roller inductor. Please contact Harry J. Irwin, KF0QB, 292 Upper Valley, Spearfish, SD 57783; or e-mail HJIrwin@WEBTV.net.

◇ I am looking for other hams who are Shriners and/or Shrine-ham radio clubs. Contact Noble Charles E. Martin, AB4Y, PO Box 640, Keyport, NJ 07735; e-mail cemab4y@usa.net.

Radio Coaches

Team up with the ARRL for an exciting public service challenge!

Over the years, in the pages of *QST*, countless letters and articles have been written about Elmers, those patient, inspired individuals who thoroughly enjoyed bringing newcomers into the world of Amateur Radio. Maybe one of those newcomers was you. If so, then you know how discovering Amateur Radio at a young age made a difference in your life. Maybe it taught you how to build relationships with adults, gave you an edge in learning math and geography, or perhaps even put you on the path to a rewarding career.

Now there's a way for you and your fellow club members to become part of a national program focused on bettering the lives of young people everywhere. You can do it through Amateur Radio in your community and we'll provide the game plan!

Presidential Summit Kicks-Off National Campaign

Earlier this year in Philadelphia, President Clinton and former President Bush, along with other national political figures and people from communities across the country, gathered for the "President's Summit for America's Future." The highly publicized event was organized to kick off "America's Promise, the Alliance for Youth," a national, multi-year campaign to better the lives of the nation's young people and put them on paths for brighter, more productive futures.

This praiseworthy objective stimulated the interest of many Amateur Radio operators who understood our spirit of volunteerism and commitment to youth. That's why the ARRL Board of Directors authorized the creation of the "Radio Coaches" program to encourage more membership involvement in youth activities.

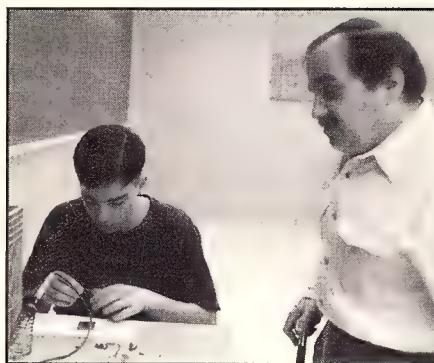
If your club chooses to participate, you'll be in good company. Until the year 2000, individuals, educational organizations, and businesses throughout the United States are making commitments to help ensure that young people have access to five critical resources: (1) ongoing relationship with caring adults; (2) safe places and structured activities during nonschool hours for learning and growing; (3) a healthy start through proper medical care; (4) marketable skills through effective education; and (5) opportunities to serve their local communities.

The types of commitments being

pledged range from a bank that will give jobs to 500 local inner-city youths and provide volunteers for their schools, to an eighth-grade class who will tutor local elementary school students to prepare them for their transition to middle school. To fulfill our commitment, Radio Coaches focuses on the energy and ingenuity of our Affiliated and Special Service Clubs.

Radio Coaches—Amateur Radio's Commitment to Youth

How does it work? From day one, we supply information to help your Affiliated or Special Service Club form a "coaching team." Your team will build a relationship with a local school, community organization or other institution from which you will recruit your "athletes." You will coach young people in your community on the basic elements of electronics and the magic of radio communication through exposure to Amateur Radio. In addition to students gaining experience with Amateur Radio, you may arrange field trips to technology museums, radio conventions and hamfests. Or you may choose to introduce students to local businesses such as radio/TV stations, airports, paging services, cellular telephone providers, police and radio dispatchers and others who use radio technology. Your job as a coach will be to make every member of your team more aware of how these experiences can lead to career opportunities in the emerging world of telecommunications.



Rob, N2JIX, ARRL Official Observer and Observer Coordinator, helps Ian, AA2XR, with some soldering techniques at the Long Island Mobile Amateur Radio Club "junior operators" meeting.

The ARRL will support this effort by providing clubs with flyers to help recruit youngsters, curriculum materials and other informational resources necessary to make this program work for everyone. We'll also provide youth packages with handouts to accompany the curriculum materials. We'll supply the strategy and you'll supply the energy and imagination.

Why did we settle on the concepts of "coaches" and "teams"? We want to reinforce the idea that Amateur Radio is a "sport for the brain." Ham radio provides not only a lifetime of enjoyment, but also, potentially, a lifetime career. Introducing a gentle note of competition will get your "athletes" excited about learning, and get them thinking about pursuing a vocational interest in technology. In this game everyone wins!

Going for the Goal

Together, our mission will be to give young people an ongoing relationship with a caring adult and a marketable skill through effective education. Amateur Radio will be our chief tool.

The ARRL's long-term goal will be to recruit as many as 100 clubs into the Radio Coaches program. Each club would make the commitment to help at least 20 youngsters per school until the year 2000. With this plan, the Amateur Radio community could influence approximately 4000 students. The ARRL will help support you during the time of your commitment. As the year 2000 draws closer, we'll be compiling a casebook on your most successful programs from around the country.

But it will only work if you put on your coaching hat. Enthusiastic Amateur Radio volunteers have the tools, the knowledge and the commitment to public service to make a valuable contribution to young people in our communities. We hope you'll start talking with your fellow hams and club members right away. Begin considering ways in which you can make a valuable contribution to this program and today's youth.

Find Out More!

For more information on how you can get involved in our Radio Coaches program, contact "Radio Coaches" c/o Field Services Department, ARRL, 225 Main Street, Newington CT, 06111; e-mail coaches@arrl.org.

QST



Q Don Cook, KJ4PO, asks, "I recently purchased a used headset and microphone at a flea market. There was no documentation. What is the best way to 'characterize' the components? In other words, how do I go about determining the impedance of the earphones and microphone, and what the microphone needs to function properly?"

A The best way to characterize headphones is to measure their impedance at several frequency points, but most hams don't own the necessary equipment. You can make a crude measurement with a simple voltmeter. Place a potentiometer in series with the headphones and feed an audio signal to them (preferably a 1-kHz continuous tone). With the voltmeter on the ac setting, measure the voltage across the headphone and across the potentiometer. Adjust the resistance of the potentiometer until the voltages are the same. Disconnect the potentiometer and measure its resistance. The result will be reasonably close to the impedance of the headphones—at least close enough for amateur work.

The microphone can be characterized by running it into a very high impedance audio amplifier, and then placing different loads across the microphone until the audio characteristics are optimized. The maximum volume may not correspond to the best audio characteristics. It is quite common for people to just "approximately" load the microphone and use an external equalizer. This allows more flexibility.

Q I am trying to use my new tiny mobile radio in my shack, but it is so small and light that I keep pulling it off the table when I pick up the mike. I don't want to screw a second bracket into the table, and the bracket that came with the radio is installed in my car. Any suggestions?

A For years hams have had similar problems with CW paddles moving across operating tables—the new generation of tiny VHF/UHF rigs have now joined this "mobile" group. Standard cures have included old-fashioned black friction tape and pieces of indoor/outdoor carpeting. Since this new variation on the classic problem is due to new technology, perhaps you might try a new-technology cure. Place a mouse pad under the rig! They are often available for a dollar or two at flea markets. If the rig still moves, cut the mouse pad in two and join the two smooth sides with a few dabs of glue. Now you have the rough bottom side on both top and bottom, which should hold almost any rig in place!

Q Josh Gould, KC8EQ, asks, "I own a VHF transceiver that is capable of MARS (Military Affiliate Radio Sys-

tem) reception. What are some of the popular VHF MARS frequencies?"

A The most active VHF MARS frequencies are:

Army—143.990 MHz

Navy/Marine Corps—148.375 and 148.975 MHz

Air Force—143.450 MHz

Q One of the new software packages I recently downloaded uses my SoundBlaster compatible audio card. The installation instructions suggest connecting both channels to the monaural input from my receiver. What sort of cable can I use?

A You can take a piece of shielded wire and connect the inner conductor to the tip on a standard monaural 1/8-inch audio plug on one end, and the other end of the center conductor to both the tip and ring of a stereo plug on the other end. The shield of the cable goes to the outside barrel on both ends. If wiring 1/8-inch plugs is not your favorite occupation, you can buy a pair of stereo plugs with a convenient length of wire between them—say, 4 feet. Then a converter plug, such as Radio Shack 274-374, will convert one end to monaural by shorting the tip and ring contact together. This converter plug goes to the audio output jack of your receiver. The other, unconverted end of the cable goes to the SoundBlaster input jack.

Q Most of the books describing the ways to set up a ham shack suggest running a ground bus behind the equipment, and tying all of the ground connections to this bus. I found ground bus bars in an advertisement, and they cost over \$5 a foot! Isn't there a cheaper way?

A Of course! Just use 1-inch wide (or wider), perforated chimney strapping. The conductivity is not as good as silver-plated copper, but for short runs (under 10 feet) you should not see any difference. Use a no. 8 or no. 10 screw, two flat washers and a lock washer to make a set of tie posts every six inches or so. Large-headed wood screws spaced 12 inches or so will hold the ground bus in place. The total cost is probably under \$6 for 10 feet.

Q Paul Walcott, WD8H, asks, "What is the legal status of cross-band contacts? Specifically, would it be legal for a Technician licensee to transmit on 2 meters and listen for a response from a General (or higher) licensee who is transmitting on 160 meters? In both cases, the individuals are transmitting within the limits of their licenses."

A Cross-band QSOs are completely legal. In fact, they are common on VHF, especially through satellites. Also, some VHF and UHF repeaters have FM cross-band links to the FM portion of 10 meters. These links allow Novices and Technicians to work DX when 10 meters is open.

The type of operation you describe, while legal, isn't common for one reason—every QSO must be scheduled in advance. If a Technician randomly calls "CQ" on 2 meters expecting an answer on HF, he or she will be waiting a long time!

Q I'm about to invest in a 56 Kbps modem for my home PC. I use the Internet quite a bit to swap ham software, exchange e-mail and stay on top of the latest developments in Amateur Radio. However, I'm tired of slogging through the Web at 28.8 Kbps. What is your take on the new 56 Kbps units?

A The new 56 Kbps modems are wonderful devices, but your purchase decision is going to be a little complicated!

The problem is that there are two high-speed telephone-modem technologies doing battle for domination of the computer market. US Robotics (USR) was the first entry in this race when it began shipping its X2 modems early this year. But right on its heels came Rockwell/Lucent's K56flex design.

Here's the catch: The two products offered by USR and

Rockwell are *mutually incompatible*. Your new 56 Kbps modem will only work if you deal with an Internet service provider (ISP) who is using the same technology as you!

An ad hoc committee of the Telecommunications Industry Association (TIA) was formed to develop a North American 56K standard. This will then be submitted to the International Telecommunications Union (ITU). The committee will review the technologies, and it will either pick one of the competing versions, or something very close to it. While we wait for a decision, the war still rages between USR and Rockwell/Lucent.

If you're worried about buying a 56K modem with the "losing" technology, don't. Both sides have already announced that they will offer free upgrades once the standard is chosen. Until that happens, the best advice is to buy the same technology that your primary ISP is using.

But if you buy a 56K modem, will you really enjoy data transfers at 56 Kbps? Not necessarily. You certainly will *not* be uploading at 56 Kbps. The maximum upload speed remains set at 33.6 Kbps. (Because of this difference between upload and download speeds, these technologies are called *asymmetric*.)

Here are the requirements for you to be able to get the greatest benefit from a 56 Kbps modem:

- A good local connection to your telco central office switch. In other words, a low-noise telephone line.
- An account with an ISP that offers 56 Kbps.
- A match between the technology that you use and the type offered by the ISP.

Even if you have the right equipment and matching technology on each side of the connection, the data rates will vary considerably. Is it realistic to expect you will get 56 Kbps each time you download? The answer depends on your connection to your provider. If your connection is superb and virtually noise free, you may indeed approach 56 Kbps. But if you are not presently getting 28.8 Kbps out of your 28.8 modem, don't expect to get 56 Kbps!

By the way, there is a 30-year-old federal regulation that caps downstream data transmission speeds over regular phone lines at 53 Kbps because of potential interference with adjacent lines' traffic. Manufacturers are trying to have the rule waived. This will require approval from the carriers that the law was supposed to protect.

Q Help! My junk box is out of control! What did the old-timers do with small collections of resistors, screws, diodes and dozens of other parts?

A One favorite solution was to go out and find a baby—or more accurately a source of baby food jars. There are one or two popular sizes for baby food, and one or two more for junior food. The low cost of these jars (today saved from the fate of recycling) makes it practical to use a separate jar for each nut size, screw size, washer size, diode type and whatever else is overflowing from that cardboard box on your work bench.

Q Where can I find a simple explanation of frequency hopping as it applies to spread spectrum communication?

A The answer is as near as the *ARRL Handbook*. Here is a small sample to whet your appetite ...

"Two obstacles to sending greater amounts of information are bandwidth and frequency congestion. *Spread spectrum* implies the use of a wide bandwidth, and that's correct, in a way. It doesn't mean that a station transmits a single 'wide' signal, but that it slices a whole band into a belt of frequencies that it can use virtually simultaneously. Although a signal is actually present only on one frequency at a time, the effect is that of having a whole band to operate within.

"The bandwidth of an amateur emission is restricted by FCC specifications. A signal may only take up a given amount of space. If so much information is to be carried that the transmitted signal becomes too broad, it reduces the number of stations that can use a band. If several stations wish to transmit simultaneously on one

part of a band, one of two things happens: They interfere with each other or they must take turns, thereby reducing the total amount of information that can go through each RF circuit over a period of time.

"On the other hand, what if a station could transmit information over a wide range of radio frequencies, but use only one at a time? Assuming the transmitter and receiver were synchronized, a signal could jump from one frequency to another in a matter of milliseconds. Each 'hop' would last a mere blink of an eye (or actually, much less time than it takes a human to blink an eye). Now several stations could occupy the same bandwidth at the same time, as long as their respective hops didn't coincide too often. With the proper electronic processing (computer hardware and/or software), each pair of stations could have the equivalent of a whole band to themselves. And several pairs of stations could see almost the same 'free space' on a band because the only time they would be aware of each other would be if a random hop happened to coincide.

"Mathematical formulas can be used to minimize the odds of frequent 'collisions' and a list of specific 'plug-in' frequency schedules could be used to allow outsiders to monitor a frequency-hopping QSO or to locate and respond to a CQ. (In fact, the FCC has stated that hams may use only a narrow range of spread-spectrum schemes. This makes it possible to monitor such operations. It also precludes hams from using protocols that might effectively amount to data encryption.)"

Q What is coherent CW?

A To the untrained ear, coherent CW sounds identical to "normal" CW—except that the characters are sent in a very precise manner. The Morse is sent and received by computer and, because of the synchronized nature of the mode, can be "understood" in less-than-optimal conditions. As with other digital modes, the text appears on the computer monitor as it is decoded.

The standard speed for coherent CW adopted by Ray Petit, W7GHM, when he designed the system was 12 WPM. Ray specified the dot length as 100 ms, an element space at 100 ms, a dash and character space at 300 ms and all other spaces as multiples of 100 ms. This timing is still in use today.

Coherent CW depends entirely on accurate timing based on the element length. Imagine two square waves, both identical in timing but derived from separate oscillators and having the mark length equal to the space length and both these equal to 100 milliseconds. If started together, they will stay in step indefinitely if the clocks generating them are perfectly stable. The original hardware coherent CW system was based on this principle and highly stable oscillators and transceivers were required. This is the main reason why coherent CW never generated much enthusiasm in the ham community when it was first introduced.

Thanks to the evolution of personal computers and software, coherent CW is now possible with most modern commercial transceivers. The rigs are reasonably stable and software can be used to generate precisely timed code (and compensate for drift as well).

Despite the fact that it's easier than ever before to run coherent CW, there is very little activity. The few coherent operators on the air are usually found about 20 kHz up from the bottom ends of the bands. (Watch for stations calling "CQ CCW.") Coherent CW has been superseded by more advanced digital communication schemes such as CLOVER and PACTOR II. Still, coherent CW may be the only synchronized digital mode that is decodable by both the human brain and computer!

Do you have a question or a problem? Ask the doctor! Send your questions (no telephone calls, please) to: "The Doctor," ARRL, 225 Main St, Newington, CT 06111.

QST

On the Road: The Joys of HF Mobile

You've just purchased the finest machine the automobile industry has to offer. You're still drooling over the purring engine, the gleaming chrome, the crushed-leather interior. The crisp new-car fragrance is as fresh as the paper floor mats.

You're standing at the gates of automotive Nirvana, but the scenario isn't complete. Before you cruise the streets in your fabulous new monument to mechanical engineering wizardry, there's one thing you *must* do ...

Slap a big, ugly antenna on it!

Hams will shudder with envy as you ooze down the boulevard with your HF monstrosity whipping in the breeze. The nonham heathens will just shudder, but what do they know? They can't appreciate the pleasures of tickling the ether from the front seat of an automobile. "Paradise by the dashboard light" has a somewhat different meaning for them.

But HF mobiles aren't quite the rare animals they used to be. We're hearing more HF-active hams on wheels these days because...

- Antenna restrictions and RF interference problems are making it increasingly difficult to operate at home.

- Two-income households are squeezed for time. After work, dinner, taking the kids to soccer games and so on, there's nothing left for Amateur Radio.

- Compact transceivers such as the ICOM IC-706, Kenwood TS-50, Yaesu FT-900, Ten-Tec Scout and Alinco DX-70 make HF mobile operating easy and affordable.

My own story is typical. I have a 3-year-old daughter who is the center of my personal universe. When it comes to choosing between an afternoon at the park with her and an afternoon in front of the radio, my daughter wins in a heartbeat. Life is short and kids are only kids for a few precious years, so *nothing* gets between my daughter and me—not even ham radio.

The solution is to work Amateur Radio into those little chunks of time that remain unreserved. I have two ideal time slots each weekday: my 30-minute commutes to and from the office. With an IC-706 transceiver installed in my Saturn SL-2, I work 20-meter SSB or 2-meter FM. Or listen to shortwave broadcasts. Or listen to airliners on 125.800 MHz as they approach Bradley International Airport. Have I left anything out?

Take it from me—mobile operating is *fun*! I'm on the air and enjoying our hobby more than I have been in years. My wife is happy with the disappearance of my backyard antennas (although a few still haunt the attic) and my daughter doesn't have to compete with a silicon-based lifeform for her dad's attentions.

HF in a Saturn?

Ask any Saturn owner and he'll tell you that the exterior of this fine automobile is mostly polymer plastic. Only the hood, roof and trunk are metallic. Considering the fact that an HF mobile antenna needs a decent ground plane to function, where are you going to find such a thing in a Saturn?

A volt-ohm meter supplied the answer. I connected one meter lead to the negative terminal of the Saturn's battery by way of a l-o-n-g piece of wire. I used the remaining lead as a probe, touching various metal surfaces and watching the LCD readout. When

Can't
enjoy
ham
radio
from
home?
Try it
from
your
car
instead!



My 1993 Saturn SL-2 adorned with a 20-meter Ham Stick antenna on a magnetic mount (center of trunk lid). The quarter-wavelength 2-meter whip is visible on the left-hand edge of the lid.

my probe met the underside of the Saturn's trunk lid, bingo! The meter displayed nearly zero Ω , meaning that the lid had "continuity" with the car's interior frame and electrical ground system. I had finally struck gold—a "golden" ground plane, at least.

My antenna choice was the monoband Ham Stick because I was primarily interested in 20 meters. (There are plenty of alternative antenna choices. See the sidebar "Which Antenna?") I didn't want to install the Ham Stick permanently. Instead, I wanted an installation that I could remove quickly if necessary. The obvious solution was a magnetic mount planted squarely in the center of the trunk lid. Most "mag mounts" for HF antennas are large contraptions with three or four disc magnets. They're big and obnoxious, but they do the job. My IC-706 has 2-meter capability, so I also installed a tiny 2-meter whip antenna along the edge of the trunk lid. It's designed for easy removal, too. Just loosen the allen nuts and it's gone.

I nestled the main body of the IC-706 in the trunk, holding it in place with Velcro straps, and routed the external speaker leads into the passenger compartment. With the auxiliary speaker safely perched atop the back dash, the next task was getting power to the radio. Or, in my case, getting the radio to the power!

Inside the engine compartment I located the thick rubber grommet that passes the wiring harness through the firewall and into my Saturn. With a large screwdriver I pried away the edge of the grommet and slipped in some stiff, insulated wire. I pushed the wire slowly until it finally appeared below the interior dashboard. I secured the ends of the dc power leads to the wire, then pulled gently from the engine side until the leads popped into view. I added fuses to the negative *and* positive leads before I attached them to the battery terminals.

You can't operate a radio if it's in the trunk, which is why I purchased a rig with a detachable front panel. I simply snaked the data cable from my IC-706 to the transmission hump between the front seats. With a little strip of Velcro tape (isn't that stuff great?) I was able to install the front panel directly behind the shift lever. I screwed a 20-meter Ham Stick into the mag mount and was ready to hit the highway.

Tuning the Antenna

I started the Saturn and deftly thumbed my transceiver's **POWER** button. I felt like Captain Picard on the bridge of the starship *Enterprise*. "Warp 9, Mister Data. Engage!"

The 706 came to life with a roar of static. I set the rig to 14.250 MHz, picked up the microphone and uttered my call sign. If I were really on the *Enterprise*, I would have heard Scottie screaming, "The SWR is too high, Captain! She won't take much more!" Too high is an understatement. I stared at the radio's LCD display in dumbfounded amazement—my SWR was *infinite*.

More tests showed that my SWR was infinite from one end of the band to the other. There was better news on 2 meters where my

little whip was presenting a 1.3 to 1 SWR at 146 MHz.

"Okay," I muttered. "I can deal with this." In truth, I had already guessed the problem. You see, contrary to accepted mythology, mag mounts *do not* couple to ground through the magnets. I had naively hoped that the ground connection established through the coax and the transceiver would be sufficient for the antenna. Wrong!

So, how would I go about grounding the mag mount without defeating its portable purpose? The solution was to run a short length of copper braid from the underside of the trunk lid (where it was attached with a machine screw) to an impromptu ground attachment (equipped with a wing nut) on the mag mount. Now my Ham Stick was grounded right at the trunk and I could still remove the mount easily. All I had to do was loosen the wing nut and pull.

The improvement was dramatic! The Ham Stick was now resonant with a 1:1 SWR at about 14.100 MHz. At the band edges the SWR climbed to about 2:1. I trimmed the whip a little and that brought the resonant point up to 14.200 MHz, which is exactly where I wanted it for phone operating.

"Wichkey Barbo Bait—Mobile!"

I finished my mobile installation on the weekend of the IARU HF World Championship contest. Twenty meters was alive with DX. It was the perfect time to test my new station!

As I hauled my toolbox back into the house, I noticed that my wife and daughter were about to leave for the garden store. "Don't bother!" I barked like an overstimulated Chihuahua. "Lauren and I will go. You stay home and take it easy."

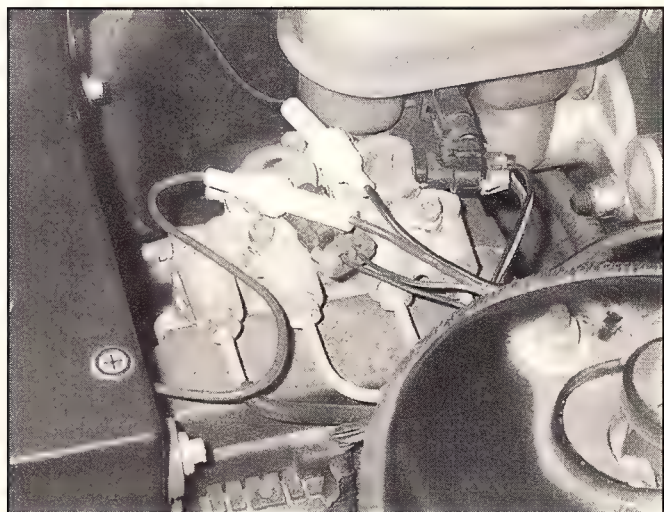
My wife's eyes narrowed. "You hate the garden store. Their greenhouse gives you allergy headaches."

"But it's a perfect day to try my new sinus medication, don't you think?"

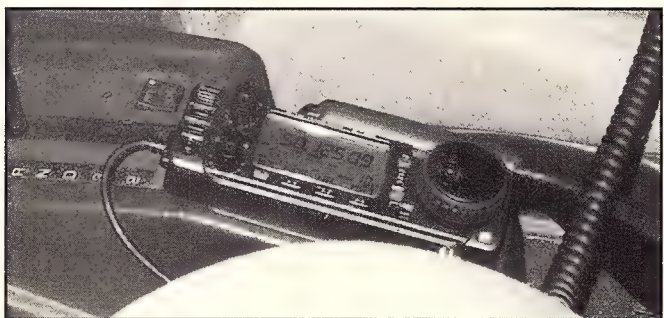
She glanced past my shoulder at the Saturn sitting in the driveway. "Oh, you put that *thing* on your car. I suppose you need to test it."

"Well, that would be nice, too."

Ten minutes later my daughter and I were zipping down Interstate 91. Twenty meters was wide open and a German station was



The dc power cable from my IC-706 is connected directly to the Saturn's battery. Note that there are fuses in *both* leads.



With a little adhesive Velcro I was able to attach the 706's remote front panel right beside the driver's seat.

Which Antenna?

Check the advertising pages of *QST* and you'll find a bewildering variety of HF mobile antennas. There are pros and cons to each:

- The slender monoband Ham Sticks (and similar models) offer low wind profiles and more aesthetically pleasing appearances, but you must replace one antenna with another to change bands. They're lightweight, but I wouldn't recommend trying a trunk-lip mount. Select a magnetic or bumper mount instead.

- "Resonator" antennas have been popular for years. Again, however, you must swap one resonator for another to change bands. The exception is the "multiple resonator adapter" that allows you to feed three resonators from a single coaxial cable. The result looks like an electric porcupine. Regardless of which approach you choose, attach this antenna to your car with something sturdy (like a bumper mount).

- Multiband mobile antennas such as the Outbacker, the Multi-Band Spider, the Palomar AN-7, the Comet CA-HV and others attempt wide coverage (80-10 meters and sometimes beyond) while still maintaining a relatively low profile. Except for the Comet and Spider (which use multiple coils), you must change taps to change bands.

- On the high-profile side, check out the Broadbander BB3 by T.J. Antenna, the QMS package by SGC, the Texas Bugcatcher by GLA Systems or the Model 1500 from High Sierra. Most of these HF mobile antennas systems employ some type of remote tuning. They're *big* and need rugged mounting schemes to match. A durable bumper mount is the minimum requirement.

rounding up contest contacts on 14.190 MHz. When he said, "QRZ?" I threw my call sign into the fray.

"The Whisky Bravo Eight mobile, come now," he replied. "Yes!" I shouted, pumping my fist in the air. My daughter giggled from her car seat and spoke into an imaginary microphone. "Wichkey barbo bait—mobile!"

I completed the contact and proceeded to make about a dozen more before we reached our destination. In the short space of 15 minutes I worked stations in Spain, Switzerland, Hungary and Romania, just to name a few. As I strolled through the hot, humid, stinking, pollen-infested, godforsaken greenhouse I was beaming with triumph.

My Commuting Companion

In the days and weeks that followed, my mobile transceiver became my commuting companion. Twenty meters is fairly quiet when I'm on my way to work at about 1130 UTC, but I often hear Asian stations popping through around 14.200 MHz. By the time I reach the office, propagation conditions have shifted and the Asians have faded into the noise. (As of this writing I haven't bagged a Japanese contact from the car, but I'm working on it!) If the pickings are slim on 20, I jump to 2 meters and check out the local repeaters. If the repeaters are silent, I head back to HF for the shortwave broadcasters. English-language programming from Radio Sweden comes booming into the northeast in the early morning!

During the afternoon drive homeward, 20 meters is usually hopping. I'll never forget the time I busted a pileup and worked Market Reef while waiting at the Burger King drive-up window. When the OJØ called me, I almost replied, "One Whopper with cheese. No mustard or pickles, please."

And if you tend to commute at roughly the same times each day, you often run into the same people. I frequently hear Vag, G1ØEJU, on the band in the late afternoon from Northern Ireland. You can't imagine how surrealistic it is to be barreling down an Interstate highway and chatting with Vag—3000 miles away—at

the same time.

This isn't to say that all of my mobile enjoyment is DX oriented. Domestic contacts are equally rewarding. During many commutes I simply listen to the conversations. One day I overheard a ham describe a harrowing flight across central Africa in an ancient twin-engine Beechcraft. They were only an hour into their flight when an engine burst into flames. The pilot shut it down, but they had nowhere to land—and hundreds of miles left to go on the remaining engine! (They completed their nail-biting journey safely.)

And there are heartfelt moments, too. Early one morning I heard a fellow calling CQ on the high end of 20 meters. I answered, even though I was only minutes from the office. As we talked I mentioned that my 13th wedding anniversary was coming up that weekend. He replied that he and his wife had been married for 54 years, but that she had gone into a nursing home a few days ago. You could hear the loneliness and despair in his voice. Changing the subject, I asked what he was doing later that day. "Nothing," he replied. "Without her in the house it's unbelievably empty. Thank goodness for Amateur Radio."

Tips and Techniques

Just because I can string words together, that doesn't mean that I'm an HF mobile guru. Far from it! I have managed, however, to accumulate some small nuggets of wisdom that you might be able to put to good use.

- **An effective noise blanker is worth 10 times its weight in gold.** When you're shopping for HF mobile transceivers, check their noise blankers *carefully*. An effective noise blanker makes all the difference between a fun mobile experience and one that will put you in a mental hospital. A good blanker will virtually eliminate ignition noise; a lousy unit will do almost nothing at all. *QST* product reviews usually include discussions of noise blanker effectiveness.

Blankers will not eliminate all bothersome signals. If you find that your car is creating unacceptable noise, there are a number of techniques that may squelch it. Pick up a copy of the ARRL book, *Radio Frequency Interference—How to Find It and Fix It*. Contact the ARRL Publication Sales department toll free at 888-277-5289, or see the full ARRL publications line on the Web at <http://www.arrl.org/catalog>. While you're at it, grab a copy of *Your HF Mobile Companion*.

- **Turn off the receive preamp.** If you own a modern HF transceiver, chances are it has a front-panel button that allows you to disable the receive preamp. Use it! Turning off the preamp will do wonders for your noise levels. You won't hear the weaker stations, but you're not likely to work them anyway (see next page). With your preamp off you'll enjoy quieter conditions and you'll still hear plenty of signals when propagation is good.

- **Keep the capabilities of your mobile station in perspec-**

Which HF Band?

80 meters: Terrific nighttime band, but often crowded and difficult for mobiles. If you hope to do well on 80 from the car, you'll need to invest in one of the big mobile skyhooks. The slim, low-profile antennas just aren't efficient enough to do more than a mediocre job on 80 meters.

40 meters: Regional coverage by day, DX by night. After dark the shortwave broadcasters wreak havoc on the phone portion of the band, making conditions especially rough for hams east of the Mississippi. Once again, you may need a larger, more efficient mobile antenna if you want to take maximum advantage of this band.

30 meters: CW and digital only. Few mobile operators.

20 meters: A super band for mobiles, although you may find it difficult to be heard when conditions are good and the band is extremely active. The DX hunting is easy on 20.

17 meters: This may be one of the best bands for HF mobiles. It's almost always open to *somewhere* during the afternoon. The band is never crowded, however, so interference is essentially nil. A little signal goes a long way on 17.

15 meters: Similar to 17 meters, but open less often. When we reach the crest of the sunspot cycle in a few years, 15 will be a hot daytime and early evening DX band.

12 meters: Dead as a proverbial doornail and probably not worth much interest at present. The potential for 12-meter DX improves considerably with the return of the sunspots.

10 meters: When it's open, watch out! Ten watts to a wet string will work the world. When it's closed, you'll swear that your antenna is disconnected. At the next sunspot peak, this will be a very hot daytime and evening DX band.



My heavy duty mag mount—before "modification."

QRV CW/m

The most fun I've had in my nearly 40 years as a ham has been operating mobile CW. My mobile HF rig tended to gather dust until I discovered that driving and CW were not incompatible and that I could copy CW much better than I'd first thought. In recent years, I've run into more and more CW/m ops and have enjoyed several mobile-to-mobile CW contacts. Still, I encounter many stations who have never worked a CW mobile station before, and they're always amazed at what we CW/m ops take for granted.

How do you do it? Well, the first requirement is that you have to be fairly proficient in CW and able to "copy in your head." It's unlikely you'll be able to jot down CW and drive at the same time—at least not without potentially disastrous consequences. You don't have to be fast, but it helps. Mobile CW also has taught me to be concise. For starters, I send everything just once (the other op will ask for a "fill" if he doesn't copy), use lots of abbreviations and little punctuation. Also, I'll often simply use BK to turn it over instead of sending both call signs.

For me, CW helps "shorten" my commute to and from HQ (approximately 45 minutes), although I shut down the rig if heavy traffic or bad weather intervene. Safety always comes first! My modest setup (100 W to a simple mobile "stick" on the roof) can work around the world if conditions are right. The /m designator sometimes attracts attention in a pileup, too. On 40 meters, my favorite band, I regularly work into Europe in the evening. Other times, I enjoy a lengthy rag chew with friends or new acquaintances. I've even operated contests from my car! (see "Sweepstakes Shack on Wheels," *QST*, Nov 1993).

Today's cars do not lend themselves to ham radio installations, so you'll need to figure out how to put the transceiver's controls and (especially) your key or keyer paddle (preferred) in a comfortable and safe location. Yes, it's possible to strap a key or paddle on your thigh, but you must remember to take it off before you exit the vehicle. My paddle sits atop my transceiver because I have room in my car. But I've also operated from other vehicles with the paddle in the (unoccupied) passenger seat.

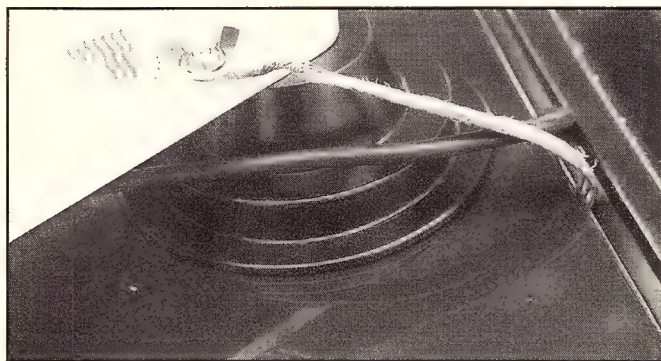
Other Headquarters staff have toyed with CW mobile, too. Ed Hare, W1RFI, has been active under his old call, KA1CV, on the CW county-hunter's net on 14.056 MHz. Ed's CW mobile motto is, "45 WPM at 55 MPH," but he confesses that he is lying about one of these "parameters!"

Operating CW on the fly has added another dimension to my hamming activity, and it's loads of fun! For more tips, see "A-1: It's Not Just for Homeburgers," *QST*, Sep 1991.—Rick Lindquist, N1RL

tive. No, you will not be the loudest signal on the band. No, you will not be able to work everyone you can hear. Yes, your signal, and the signals you're listening to, will fade in and out as you zip beneath overpasses, slink through deep valleys and so on. In other words, don't expect the same performance that your buddy gets from his tribander atop an 80-foot tower. Since you don't have an ideal station at your disposal, you have to play the game a little differently. For example, keep your transmissions short to make sure the other person is still copying you. When you're trying to crack a pileup, hesitate a couple of seconds before tossing out your call sign. Let the big guns butt their heads together first. And always tag your call sign with the word "mobile"—many DX stations will make special efforts to work mobiles if they know they're out there.

- **Install a decent auxiliary speaker.** Unless your car is exceptionally quiet, you're going to have road noise competing with the audio from your transceiver. Most built-in speakers are small; they're not designed for high-decibel workouts. Invest in the best external speaker you can afford. Good audio fidelity at high volume levels is the top priority.

- **Be kind to your battery.** It's incredibly easy to deplete your car battery. A typical 100-W transceiver draws about 25 A in transmit. Even when receiving they'll drain as much as an amp or



Grounding the mag mount to the trunk lid with a piece of copper braid made it possible finally to resonate the antenna. I used a wing nut for quick, easy removal.

more. Operate with your engine running so that the alternator can keep the battery fully charged. If you must operate with the engine off, make it brief.

And don't forget to turn off your radio when you leave the car! If you install your rig by connecting it directly to the car battery, the radio will remain on when your ignition is off. Because my IC-706 has 2-meter capability, I often find myself chewing the fat on local repeaters. This is a little dangerous because I tend to use the '706's squelch function to preserve my sanity. Unless the radio is blaring when I pull into the driveway, my impulse is to simply switch off the Saturn and walk away. The result would probably be strange voices outside in the middle of the night and a dead battery the next morning!

Fortunately, there is a nifty little device that you can install at your battery that will automatically cut power to your transceiver if you forget. It's the BS-25 automatic battery saver from Oak Bay Technologies. Contact Oak Bay at PO Box 65494, Port Ludlow, WA 98365; tel 360-437-0718; <http://members.aol.com/oakbaytec>.

- **When you install your transceiver, make sure it's secured.** This is particularly true for transceivers in passenger compartments. A radio sitting on the floor or passenger seat is going to become a heavy flying object in an accident. Crunching your car is bad enough; the last thing you want is to be injured by your own radio.

- **Safety, always.** If you find yourself concentrating on the rig more than the road, *turn your radio off*. Do you really want "CQ, CQ ..." to be the last words you ever hear? Speaking of radios, don't forget that there are others who love your equipment as much as you do. They're called "thieves" and they can strike anywhere. Take your rig with you when you leave the car, if possible. Locked doors are mandatory and a security system isn't a bad idea.

On the Road Again

With contest season in full swing, I'm going to attempt HF contest mobile. By the time you read this, I'll be trying my hand at the November Sweepstakes from the comfort of my Saturn. Our Headquarters antenna expert, Dean Straw, N6BV, has encouraged me to drive to the Connecticut shoreline and park within 100 feet of Long Island Sound. He says the salt water may enhance my signal quite a bit. I'm game for a little experimentation, but if there is a nor'easter blowing I'll have to be careful not to wind up *in* the water. I also want to try 2 and 6-meter mobile VHF contesting from the tops of some of our hills and ridges. As long as there's a paved road, I'm on my way!

If you're in the mood for something different, or if antenna restrictions keep you from getting on the air, I highly recommend the mobile alternative. If I can install a reasonably efficient HF station in my "plastic" Saturn, you can put one in your car, too. And then the next time you're stuck in traffic, you can just sit back, relax, and do a little hamming. It certainly beats grinding your teeth and pounding on the steering wheel!

QST

Test Your Knowledge!

It's mighty hard to make contacts without "contact."

Even if you've never soldered, or even twisted two wires together, connections are a big part of your ham radio experience.

1. The most common series of serial data connectors is the ...
 - a. DB
 - b. ACRS
 - c. F
 - d. crimp-terminal
2. The part of a cable connector that protects the connections to the pins or sockets is the ...
 - a. strain relief
 - b. flange
 - c. backshell
 - d. boot
3. Which is *not* a coaxial connector style?
 - a. Molex
 - b. SMA
 - c. UHF
 - d. BNC
4. North-American modular telephone wall jacks are designated ...
 - a. RJ45
 - b. DB-25
 - c. AX.25
 - d. RJ11
5. RCA connectors are also known as (phone/phono) connectors.
6. Connectors that maintain a transmission line's voltage-to-current ratio across the junction are known as ...
 - a. minimum-energy
 - b. low-loss
 - c. constant-current
 - d. constant-impedance
7. When wrapping a bare wire around a screw terminal, one should make (one/one-half) turn around the screw in the (clockwise/counter-clockwise) direction.
8. Which type of crimp-terminal is often called a "quick disconnect?"
 - a. spade
 - b. ring
 - c. fork
 - d. hook

9. When installing a PL-259 coaxial connector, what part must go on first?
 - a. body
 - b. backshell
 - c. center pin
 - d. jacket
10. Bayonet-style connectors attach to their mates by a (partial/multiple) turn.
11. A connector carrying high-currents must have lots of ...
 - a. contact surface area
 - b. low-leakage insulation
 - c. temperature stability
 - d. moxie
12. Match the connector plating material with the characteristic for which it is most widely used.

a. gold	e. solderability
b. silver	f. corrosion resistance
c. tin	g. conductivity
d. phosphor bronze	h. flexibility
13. The connector that changes a transmission line from coaxial cable to waveguide is called a ...
 - a. transition
 - b. transformation
 - c. transducer
 - d. transplant
14. To prevent corrosion, what is applied to an electrical connection?
 - a. thermal grease
 - b. anti-oxidation compound
 - c. joint compound
 - d. lithium grease

Bonus! Bare wire ends are named for what animal part?

22916-107th Ave SW
Vashon, WA 98070

Total Your Score!

There are a total of 18 possible answers in this quiz, not including the bonus question. Give yourself 1 point for each correct answer.

- 13—18 You're definitely a "well-connected" individual!
7—12 The cables are a little loose in your memory sockets, but you're doing okay.
1—6 Your connector knowledge is unplugged!

457

9. b—The backshell (some call it a "coupling ring") will not fit over the body of the connector—many hams forget this step!
10. partial—Bayonet connectors (such as BNC) use a pin sliding along a track to force the shell firmly onto the mating connector, snapping into a detent in the track to hold the connector pieces together.
11. a—Contact resistance (and therefore heating and resistive loss) is reduced by increasing contact area.
12. a-f, b-g, c-e, d-h—Gold resists corrosion, silver is the best conductor of all metals, tin is easily soldered, and phosphor bronze stands up well under repeated insertion/removal cycles.
13. a—These are very interesting structures, converting electromagnetic waves from one media to another very efficiently.
14. b—Antioxidation compounds keep oxygen away from connector surfaces where they combine with metals to form nonconductive oxides.

Bonus: Pigtail!

1. a—Serial connectors on modems and many PCs are DB-style connectors.
2. c—A backshell usually holds the cable steady within the connector to prevent flexing and stress on the wire-to-pin/socket connection.
3. a
4. d
5. phono—This designation was popularized in the fifties when this style of connector was used on phonographs.
6. d—These connectors minimize power reflections due to impedance mismatches at the connector.
7. one-half and clockwise—The tightening of the screw will pull the wire around its threads instead of pushing it out from under the head. A single half-turn is sufficient; more turns prevent the screw from fully seating in the terminal.
8. a—Spade terminals are held into a mating socket by friction.

The Crystal Radio

What's old is new again!

Even a casual auditor of the amateur bands will conclude that the hobby is largely populated by wizened old geezers—and I'm one of them. This is a sad situation because most of us entered Amateur Radio as kids. If ham radio is to continue for generations to come, we must get youngsters interested in radio communication while they're still in grammar school and still capable of wonder. We need to reach them while they are still asking questions about everyday matters (that all too often go unanswered) such as, "Why does it get light in here when I push this thing?"

Reaching today's kids won't be easy. With the Internet, cellular telephones and other forms of global communication commonplace in their lives, the true magic of radio lies buried beneath the technology. We must strip away layers upon layers of complicated hardware and reveal radio in its purest form. The perfect tool to achieve this goal is the "lowly" crystal receiver.

Imagine the curiosity you'll inspire when you demonstrate a radio that has no obvious power source whatsoever! The simple crystal receiver described in this article works surprisingly well. It's selective and produces robust headphone volume. I've been able to tune several local AM broadcast stations with ease. Best of all, it's inexpensive, uses readily available parts, and can be built by a youngster (with a little guidance). Of course, adults will love this little receiver, too.

There is a fascinating resurgence of interest in crystal radios. Even hams normally accustomed to owning rigs with four-digit price tags are rediscovering the joys of simple, "powerless" reception. To get a taste of what is going on, pick up a copy of *Crystal Set Projects* from the Xtal Set Society, Box 3026, St Louis, MO 63130; tel 314-725-1172, or visit their Web site at <http://www.midnightscience.com>. (The book was reviewed in the August, 1997 *QST*, page 102.)

About the Circuit

The circuit shown in Figure 1 was developed in the early '30s by Elmer G. Osterhoudt. Selectivity problems plagued most crystal sets of the day due to the proliferation of broadcast stations. Elmer devised a solution. He determined that poor crystal receiver selectivity was caused by the headphones swamping the tuned circuit and lowering its Q. The net result was an inability to separate individual signals. Elmer improved selectivity considerably by connecting the detector near the cold (ground) end of the tuned circuit to minimize the swamping.

Capacitor C2 is used to match the antenna system, and C3 is the main tuning capacitor. Absent from this circuit is the finicky galena-and-catwhisker detector. It has been supplanted by a 1N34 germanium diode that is connected near the grounded end of the tuned circuit that includes coil L1. C1 is an RF bypass capacitor.

Headphones

You must use high-impedance headphones (2000 Ω or greater) with crystal receivers. If you attempt to use common 8- Ω headphones, you'll have very disappointing results. You'll find high-impedance headphones at hamfest flea markets, but if you're not

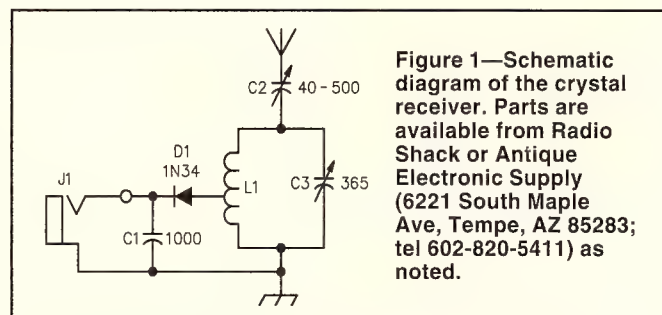


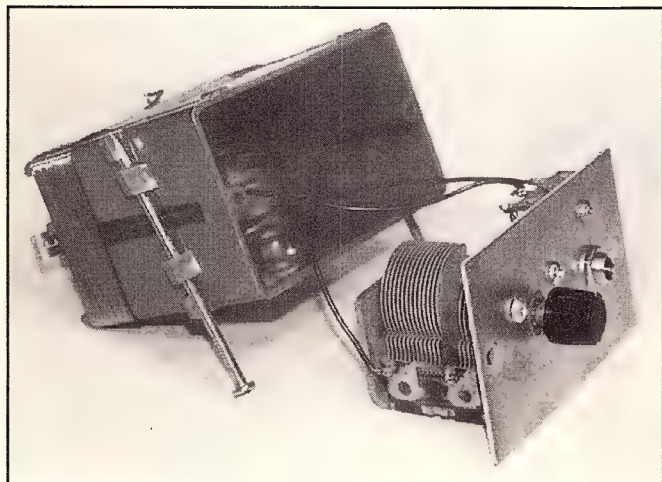
Figure 1—Schematic diagram of the crystal receiver. Parts are available from Radio Shack or Antique Electronic Supply (6221 South Maple Ave, Tempe, AZ 85283; tel 602-820-5411) as noted.

- C1—1000 pF mica or disc ceramic trimmer (Radio Shack 272-123)
- C2—40 to 500 pF trimmer capacitor (Antique Electronic Supply CV-263)
- C3—365 pF variable capacitor (Antique Electronic Supply CV-231)
- D1—1N34 germanium diode (Radio Shack 276-1123)
- J1—1/4-inch, 2-conductor headphone jack (Radio Shack 274-252)
- L1—35 feet of 22-gauge enamel wire. See text. (Radio Shack 278-1345)
- Fahnestock clips (Antique Electronic Supply SH-11-4034)
- 2000- Ω headphones (Antique Electronic Supply PA-466)

up to the hunt, you can buy them from Antique Electronic Supply (see Figure 1).

The Importance of a Good Antenna System

Since the crystal receiver depends completely on the energy from the transmitted signal, you need to gather as much signal out of the air as possible! Remember that this receiver is designed to tune the AM broadcast band. A half-wavelength dipole cut for about 1 MHz would be ideal, but few of us own enough real estate to accommodate a 500-foot long antenna. The practical solution is



Plastic electrical outlet boxes make terrific enclosures. Note that I've mounted the main tuning capacitor, C3, and the headphone jack on the front using copper-clad PC board.

to simply use an end-fed wire about 100 feet in length. You'll also need to provide a connection to an Earth ground (a cold-water pipe may suffice). With the proper antenna system, you should be able to receive most of the AM stations in your area. If you live in a rural location without an AM broadcaster nearby (within about 50 miles), try using even more antenna wire. Just string it over trees, bushes, or any other supports.

Construction

You can build a crystal receiver into almost anything. I used plastic electrical outlet boxes. They're available at home centers and hardware stores. They are attractive, rugged and inexpensive. They even serve as forms for winding the coil. I made the front panel of my box from a piece of copper-clad PC board. You can cut this material into the proper shape using a hacksaw, and it is easily drilled for mounting parts.

For C3, a miniature variable capacitor salvaged from an old AM-only radio will work, but a single-section air variable is better. If you don't have these capacitors in your junk box, don't despair. You can order one from Antique Electronic Supply.

L1 is wound on the outside rear portion of the enclosure and consists of 32 turns of 22-gauge enamel-covered wire. The coil is tapped nine turns from the grounded end. The tap is made by tightly twisting about 1 inch of the magnet wire and scraping off the enamel insulation. You can secure the windings to the enclosure with transparent plastic tape.

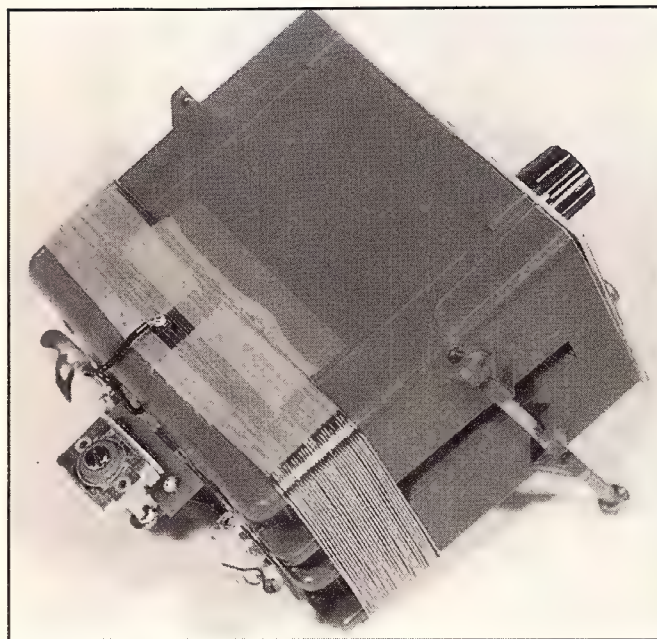
The antenna trimmer capacitor (C1) and the Fahnestock clips for the antenna and ground connections are mounted on the rear of the enclosure. The tuning capacitor, phone jack and detector are mounted on the front panel. Interconnecting wires are fed through holes in the enclosure and soldered to the trimmer capacitor, ground and cold connections.

Operating Adjustments

Connect the antenna, ground and headphones. Tighten the antenna trimmer capacitor C2. Slowly adjust C3 to tune in the stations. Note the number of stations and log their call letters and frequencies. Readjust C1 to provide the best trade-off between volume and selectivity. If you're using your crystal radio near a particularly strong broadcast station, removing the ground connections will often improve selectivity (with some reduction in volume).

Use Your Radio as a Teaching Tool!

You can use your crystal radio to teach a number of important concepts. For example:



The rear view of the crystal radio enclosure. You can easily see the windings of coil L1 held in place with transparent tape.

Inductance: Applying the "right hand rule," the coil for the tuned circuit can be used to explain how a magnetic field is developed by electron flow through a conductor, and how the magnetic field is increased by forming the conductor into a coil.

Capacitance: Varying capacitance may be illustrated by simply observing how the total area increases as the rotor plates mesh with the stator plates. The compression trimmer capacitor (C1) illustrates the function of a dielectric other than air. It also shows how the capacitance can be varied by changing the separation between the plates.

Resonance, modulation and detection: You can teach these concepts by inviting your student to tune in a station while you display the modulated RF on an oscilloscope! Move the 'scope probe from one side of diode D1 to the other to illustrate "before" and "after."

Magnetism and transduction: High-impedance headphones are ideal instructional aids to demonstrate these ideas. Disassemble a pair of headphones and show your students what's inside. Touch the permanent magnet with a screwdriver so they can see that it is indeed magnetic. Explain how the detected signal flows through the tiny headphone coil, creating a magnetic field that adds or subtracts from the field produced by the permanent magnet. This causes the metal diaphragm to vibrate, creating sound! What began as electrical energy has become mechanical energy—transduction.

Summary

Throughout the years, the simple crystal radio has spawned tens of thousands of radio amateurs, engineers and electronic hobbyists. And despite the antiquity of its design, it is still an effective tool for recruitment and instruction. A crystal radio is a delightful device, and the perfect way to introduce the wonder of radio to a young mind—or rekindle it in your own!

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QST

HF QRP "Foxhunting"

Here's a fun way to spend your wintertime weekday evenings!

Some find it maddening, but nightly cacophony on 40 meters is music to my ears! It was on Tuesday evening, October 8, 1996 at 0100 UTC, that I dived headlong into the mass of signals and experienced my first moment in the spotlight. When it was over, I was trembling with excitement. If ham radio was meant to be fun, this was *it*!

Not Your Usual Foxhunt

To call what we do a "foxhunt" is a little misleading. Most hams envision foxhunts as VHF activities where intrepid operators roam the countryside with portable antennas in search of hidden transmitters. Yes, our "foxes" are hidden, but not by physical objects. And, yes, we use antennas to hunt our quarry, but they aren't usually portable! Our territory isn't limited to a few square miles—it encompasses all of North America and beyond.

The fox station begins the hunt by sending a Morse CQ on 40 meters at or near a predetermined frequency (more details in a moment). The hounds—everyone else who is participating—listen carefully. If a hound hears the fox, the hound answers the CQ, completes the proper exchange, and then moves on to work other hounds who might also be on the air. In the meantime, the fox calls CQ again on the same frequency (or nearby, if interference forces a move). Another hound answers and the game goes on.

What's so hard about this you ask? Well, the fox and hounds are all running low power (QRP)—less than 5 W. They are doing battle with each other and, worst of all, the appalling interference that plagues much of the 40-meter band at night. This foxhunt is a test of operator skill and resolve!

The Internet QRP Club

The HF QRP foxhunts are the brainchild of Chuck Adams, K5FO, founder of the Internet QRP Club. The central purpose of the club is to use the Internet as a tool to bring together QRP enthusiasts from around the world. Members can sign up for the QRP-L e-mail reflector¹ and receive messages (advice, comments, or whatever) from other QRP hobbyists automatically. Or, they can surf the club's Web site at <http://qrp.cc.nd.edu/QRP-L/index.html>.

The Internet QRP Club foxhunts occur Monday through Thursday from October through March on both the General and Novice/Technician Plus portions of 40 meters. The starting frequencies are the recognized 40-meter QRP calling frequencies of 7.040 MHz and 7.110 MHz. Dates and times are established by the foxes before the season starts so that everyone will know which call signs to expect, and when. There can be more than one fox on the air each week, and sometimes more than one on the air each night!

The results of each hunt are posted on the QRP-L e-mail reflector and on the Internet QRP Club Web. Points are awarded to both the foxes and the hounds. You earn one point for every contact with a General, Advanced or Amateur Extra operator and five points for every contact with a Novice or Technician Plus.

My Baptism of Fire

As a relatively new Technician Plus with little on-air experi-



ence, I was reluctant to volunteer as a fox. But when Chuck Adams put out a plea for more Novices and Technicians to participate, I decided to give it a try.

On October 8, my first day as the fox, I had more than a little trouble concentrating at work. I came home early and instructed my family that I would not be available for at least two hours. If they could keep the noise level down, I would really appreciate it. (In a house with five children and two adults, it's not always easy to enjoy a quiet evening!)

At 7:00 PM local time I started calling CQ on 7.115 MHz, the closest clear frequency to 7.110 MHz. As soon as I finished sending the last long K, it sounded like my kids had found 30 practice keys and were banging on them at once! I didn't know what to do, so I simply listened. Soon enough it stopped and I sent QRZ? DE KBØROL K.

Pandemonium erupted again. There were at least a dozen people sending their calls. I could sort out one or two stations, but the pileup sounded like a continuous buzz! I listened again and was able to pick out one tone that was a little different from the others. With extreme concentration I could distinguish the call sign KK5RO. I immediately replied with KK5RO KN and we swapped the necessary information. As soon as I sent SK, the chaos returned.

The next two hours passed with amazing speed. I had to change frequencies twice, but I bagged—or was bagged—by 15 hounds in 11 states.

As the season went on I served as the fox twice each month. From my home just outside Denver, Colorado, I worked Washington, California, Michigan, Texas, Connecticut, Florida and most of the states in between. Not bad for the absolute bottom of the solar cycle.

Try It!

Do you want to join in the fray? It's surprisingly easy. Even if you don't have Internet access, listen around the 40-meter QRP calling frequencies at 0100 UTC, Monday through Thursday. Find the pileup and, chances are, you've found the fox. Of course, if you can get to the Web, check out the Internet QRP Club site for the latest scores and schedules. Remember that the dates and time are in UTC, so adjust for your location.

The exchange is simple: RST; state, province or country; name, QRP-L number or power output. For example ...
(fox transmissions are in bold type)

CQ CQ CQ FOX DE KBØROL KBØROL KBØROL K

KBØROL DE KK5RO K

KK5RO UR RST 449 449 CO CO BRAD BRAD NR 361 361 BK

KBØROL UR RST 579 579 OK OK VERNON VERNON NR 280 280 BK

R R R TNX VERNON 73 SK KK5RO DE KBØROL BK

R R R 73 KBØROL DE KK5RO SK

If you don't have a QRP-L number and your power is 4 W, just send your "number" as 4W. (You can get your own QRP-L number by joining the club via its Web site.) Don't be afraid to ask for

repeats, but, as in all contests, you should listen before you call. Don't be surprised if you are asked to repeat or even QRS (slow down). While a lot of the people who participate in the hunt can easily rag chew at over 40 WPM, they'll slow down to match your speed.

Don't forget to crank your power down (under 5 W) and join in. But please remember, if you can't hear the fox right away, don't call. You may be right on top of his signal, effectively wiping him out. Just be patient and listen.

What do you get for participating? Other than all the fun, and it is a lot of fun, at the end of the 1996 season there were a number of prizes awarded (all donated by club members). These included complete transceiver kits, keyer kits, certificates and so on. The prizes are usually determined by the end of the hunt season. If nothing else, you'll have a stack of QSL cards from around the country!

See you this winter!

Notes

¹QRP-L is an Internet e-mail reflector. All messages sent to the reflector address are automatically resent to everyone on the subscriber list. This allows the group to share comments and information. You *do not* have to join the Internet QRP Club to subscribe to the reflector.

To become a subscriber, send an e-mail message to: listserv@lehigh.edu. In the body of the message send: subscribe qrp-l <your name> <your call>. You will receive instructions on how to participate. Be careful though; this list generates a lot of traffic. Print the instructions and keep them handy in case you need to change your "settings." You can also subscribe to the QRP-L reflector directly from the Internet QRP Club Web site at <http://qrp.cc.nd.edu/QRP-L/index.html>.

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QST

New Products

SOLARGIZER BATTERY MAINTENANCE SYSTEM FROM PULSETECH

Designed to eliminate sulfation damage and extend the life of automotive and marine lead-acid batteries by as much as five times, PulseTech's Solargizer Battery Maintenance System also prevents dead batteries and expands battery capacity. Using patented pulse technology (pulsed dc), the solar-powered system reenergizes lead acid batteries and dissolves sulfates that have accumulated on internal battery plates.

Models are available for 12, 24, 36 and 48-V dc vehicle and marine battery systems, including 117-V models for batteries that are stored or used indoors. Prices start at \$59. For more information, contact PulseTech, 3131 Premier Dr, Irving, TX 75063; tel 800-580-7554; fax 214-550-1062; e-mail ppc@pulsetechproducts.com; <http://www.pulsetechproducts.com>.



SPEAKER MIKES FOR YAESU FT-50R FROM PREMIER COMMUNICATIONS

◇ To accommodate Yaesu FT-50R owners (and others who have rigs with newer Yaesu mike connectors), Premier Communications has expanded its line of speaker mikes to include the SPM-102, a full-size hand mike; the SPM-202 and '202E, rugged lapel mikes with PTT switches (receive audio is routed to "bud"-style earpieces), and the SPM-302, a lightweight hand mike with a volume control and a lighted PTT indicator. All models feature external speaker jacks and sturdy plastic cord clips.

Prices: SPM-102, \$33.95; SPM-202, \$20.95; SPM-202E, \$24.95; SPM-302, \$40.95. For more information, contact Premier Communications, 20277 Valley Blvd, #J, Walnut, CA 91789; tel 909-869-5711, fax 909-869-5710; e-mail premier@adi-radio.com; <http://www.adi-radio.com>.

QST



Product Review

Edited by **Rick Lindquist, N1RL** • Senior Assistant Technical Editor

QST Compares: Economy and No-Frills 2-Meter FM Hand-Held Transceivers

Reviewed by **Joel Kleinman, N1BKE**
Associate Technical Editor

With 2-meter H-Ts as popular as ever, the time seems right to compare the features and performance of a new generation of "economy" and "no-frills" models now on the market. Frequently we hear from readers that they're willing to sacrifice gobs of features for ease of use and simplicity in an H-T. Moreover, they don't want to pay for features they don't use. The units in this selection tend to adopt a "most-for-least" philosophy. Although all can be described as small and light, some are decidedly smaller and lighter than others. Some have quite a few features, but others are so basic that they lack even a tone pad. The *most* basic in the group has a fixed telescoping antenna and dry battery pack that uses three AA cells (NiCds are optional).

But the best news may be the prices. The



Table 1 2-Meter H-T Features

	ADI AT-201	Alinco DJ-190T	Alinco DJ-S11T	ICOM IC-T2A	Kenwood TH-235A	Midland 73-030	Standard C156
Expanded VHF reception	M	Y	M	Y	M	Y	Y
Memory channels (#)	40 + CALL	40	20 + CALL	40 + CALL	60	73	100
Memory cloning	N	Y	Y (see text)	Y	Y	N	N
Memory names	N	N	N	N	N	N	Y
Programmed range scanning	N	N	N	Y	N	Y	Y
Power output choices	H/M/L	H/L	H/L	H/L	H/L	H/M/L	H/M/L
Standard battery type	NiCd	NiCd	3×AA	8×AA	NiCd	NiCd	4×AA
Standard battery (mAh)	7.2 V (650)	4.8 V (700)	4.5 V (N/A)	9.6 (N/A)	7.2 V (950)	6 V (600)	6 V (N/A)
12 V ready?	Y	Y	O	N	Y	Y	Y
Low-battery indicator	N	Y	Y	Y	N	Y	Y
Auto power off	Y	Y	Y	N	Y	Y	Y
Automatic repeater offset	Y	N	N	Y	Y	Y	Y
Paging (code or tone squelch)	Y	N	N	Y	Y	Y	Y
Priority channel monitoring	Y	N	N	N	N	Y	Y
Keypad	Y	N	N	Y	Y	Y	Y
DTMF autodial memories (#)	N	N	N	Y (5)	Y (5)	Y (8)	Y (10)
CTCSS encoder	Y	Y	Y	Y	Y	Y	Y
CTCSS decoder	Y	O	N	Y	Y	Y	Y
Antenna connector type	BNC	BNC	N/A	BNC	BNC	BNC	BNC
Time-out timer	N	Y	N	N	Y	N	Y
Suggested retail price	\$215	\$219	\$149	\$227	\$230	\$370	\$289
Typical selling price as of 10/97†	\$170	\$173	\$120	\$170	\$173	\$215	\$200

Key

Y = Standard

O = Optional

N = Not available

N/A = Not applicable

M = With hardware or keypad modification. Details available from manufacturer (may require proof of MARS or CAP license).

†Typical selling prices represent an average of street prices obtained from three equipment retailers, exclusive of any sales, coupons or rebates. We were able to locate only one retailer that carried the Midland 73-030, however.

average street price for our seven H-Ts comes in at just under \$175—the kind of money you once expected to hand over for a *used* H-T! Despite our “no frills” and “economy” designations, many of these units still offer a wide range of features, from CTCSS encoding to extended receive, multifunction scanning and paging. Table 1 provides a quick comparison of features and prices.

All models have a variety of optional accessories that extend the usefulness of the basic transceiver. Those of us who have used the larger and heavier H-Ts of years past found that we missed the comparable speaker size and audio output on these units. Another trade-off was display size and clarity. Most of these radios have small displays that can't do justice to the “flags” (or icons) that designate various functions. All displays can be illuminated for nighttime viewing, and some feature a backlit keypad as well. Power output is in the 1.5 to 2.5 W range for most in the group, although optional battery packs or a 13.8 V supply can raise the ante to as high as 5 W.

In the recent past, we've looked at the Alinco DJ-191, the ICOM T22A, the Kenwood TH-22AT, the Standard C108A, the Standard C178A, and the Yaesu FT-10R and FT-11R (see “Product Review,” *QST*, May 1996). All of these were still on the market as this review went to press.

Our review team, all members of the Headquarters staff, put each radio through

its paces for several days apiece. This allowed us to get a good feel for each radio, and to develop our individual lists of features we liked and those we didn't. The testers were selected for their attention to detail and varying amounts of experience with H-Ts. Thanks to Pete Budnik, KB1HY; Steve Ford, WB8IMY; Jean Wolfgang, WB3IOS; Martin Cook, N1FOC; Dan Miller, K3UFG, Paul Danzer, N1II; and Mike Tracy, KC1SX, and Ed Hare, W1RFL, of the ARRL Lab for their contributions to this review.

ADI AT-201

ADI/Premier is a relative newcomer to the ham radio market. The company offers radios for VHF and UHF, including a 2-meter mobile and a dual-band H-T. A traditionally designed H-T, the ADI AT-201 feels and looks pretty solid. Ruggedness and general polish (what's sometimes called “fit and finish”) were judged as average. The ADI AT-201 has a husky frame (one user called it “too bulky for me”). ADI says some of its customers say they prefer a full-sized H-T as an alternative to what it called “small radios with tiny buttons.” The nice-sized keypad can be illuminated for nighttime use. Most of the unit's better features are accessible via the keypad.

Reviewers were unimpressed by the smallish display, however. Frequency and memory channel numbers are large and clear,

but some of the other display flags were too small to be seen easily, particularly in less than optimal lighting conditions. The display can be illuminated also.

Audio output was good except at the highest volume. On transmit, audio was judged to be above average for an H-T. One user got reports indicating very natural audio that compared nicely with his regular mobile radio. “Excellent reports received from all contacts!” commented one user. “Some people who know my voice well said I sounded better than on my own H-T.” Users reported that the supplied 7.2-V, 700 mA NiCd battery pack held its charge well, particularly with the battery save feature enabled.

Our user team's initial programming woes and confusion over how to use the AT-201 were traced to one problem—the *User's Manual*. The one supplied with our radio was for the earlier AT-200. Fortunately, the very handy *Quick Reference Guide* did match our unit, and it was sufficient for most users to figure out the radio. Subsequently, we were able to get the correct manual from ADI—which deserves high marks for its prompt response to our various customer service inquiries. Armed with the correct instructions, we found programming to be fairly simple. It takes four basic steps to put a frequency into a memory, and when you seek an empty memory slot, the AT-201 displays each memory's contents—or a blinking **M** if it's

ADI AT-201, serial number 7S40030019

Manufacturer's Specifications

Frequency coverage: Receive, 138-174 MHz; transmit, 144-148 MHz.

Power requirements: 5.0-16 V dc. Receive, ≈ 35 mA; transmit (max, high power), ≈ 950 mA at 13.8 V dc.

Size (HWD); 5.5 \times 2 \times 1.25 in; weight 13.1 oz.

Receiver

FM sensitivity, 12 dB SINAD: 0.32 μ V.

Two-tone, third-order dynamic range: Not specified.

Adjacent channel rejection: Not specified.

First IF and image rejection: Not specified.

Squelch sensitivity: 0.10 μ V.

S-meter sensitivity: Not specified.

Audio output: 250 mW at 10% THD into 8 Ω .

Transmitter

Power output (H/M/L): 2 W / 2.5 W / 0.35 W, with RBP072 7.2 V battery pack; with external supply, not specified.

Spurious signal and harmonic suppression: 60 dB.

Transmit-receive turn-around time (PTT release to 50% of full audio output): Not specified.

Receive-transmit turn-around time (“tx delay”): Not specified.

Note: All dynamic range measurements were made at the ARRL Lab standard spacing of 20 kHz.

*Measurement was noise-limited at the value shown.

Measured in the ARRL Lab

As specified.

As specified.

Receiver Dynamic Testing

For 12 dB SINAD: 0.15 μ V.

20 kHz offset, 60 dB; * 10 MHz offset, 82 dB.

61 dB.

IF rejection, 97 dB; image rejection, 77 dB.

At threshold, 0.09 μ V.

S9=2.7 μ V.

245 mW at 10% THD into 8 Ω .

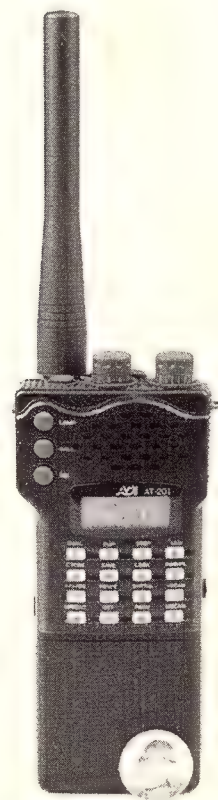
Transmitter Dynamic Testing

2.4 W / 2.4 W / 0.4 W with RBP072 7.2 V battery pack; 5.5 W / 2.7 W / 0.4 W at 13.8 V dc.

63 dB. Meets FCC requirements for spectral purity for equipment in its power output class and frequency range.

Squelch off, S9 signal, 175 ms.

46 ms.



empty—as you scroll through.

Less intuitive was the use of a steady **M** on the display while accessing special functions using the **SET** button, and the use of the **MR/ENT** key to switch between VFO and memory mode. Also, keypad frequency entry is limited. Unlike the other units we looked at (the ones with keypads, that is), to move to 146.685 MHz, for example, you can only enter “4-6-8” from the keypad. You have to give the **CHANNEL** (tuning) knob a twist to add the “5.” Once users got the hang of it, though, they had no problems.

Aside from matching the unit, the AT-201 *User's Manual* was a huge improvement over the AT-200 book. The manual is peppered with illustrations that employ little directional arrows to graphically depict step-by-step instructions. This is a good concept that works for most people. While users could find most needed information about the AT-201 in either the *Quick Reference Guide* or the *User's Manual*, neither contained battery charging instructions. A schematic diagram accompanies the manual.

You'll need to refer to the *User's Manual* or the *Quick Reference Pocket Guide* to master the use of the **FUNCTION** button and other controls. One odd feature was the prominent button on the front panel labeled **SQL**. Surprise! This isn't the squelch control at all; it's the “squelch off” button, which most manufacturers typically call “monitor.” This

allows you to momentarily disable the squelch to listen for a weak signal or to set the volume level in the absence of an actual signal. The *real*, unlabeled squelch control is a nearly invisible knob that sits practically flush atop the unit and that you turn with your fingertip—pretty awkward. On the other hand, most users don't have to adjust the squelch that often.

Much better were the sizable, rubberized top-mounted **VOLUME** and **CHANNEL** knobs. Even the most “ham-handed” user will find these easy to manipulate. The **VOLUME** knob is calibrated with a 0-10 scale, so you can reset it for comfortable listening without having to listen first. This knob also serves as the power switch.

The AT-201 has a variety of useful features, and the new manual makes it easier to figure them out. Most users considered the AT-201 at least an average performer. One called it “a good meat-and-potatoes radio.”

Manufacturer: Premier Communications, 20277 Valley Blvd, No J, Walnut, CA 91789; tel 909-869-5711; fax 909-869-5710; e-mail premier@adi-radio.com; <http://www.adi-radio.com/>. Manufacturer's suggested retail price, \$215.

ALINCO DJ-190T

Despite having only three knobs on the front panel and no keypad, it might not be fair to categorize the Alinco DJ-190T as a

“no frills” H-T. This rugged, slim unit includes many of the bells and whistles now available on more expensive H-Ts.

Its readout is large and clear with bold numbers and characters—one reviewer called it “outstanding!” Its display is the biggest of the bunch and reminiscent of the display on the big brother DJ-191T. You can light the display by pressing the **LAMP** button on the side. This was the only H-T in the group that included a drop-in charger stand. Our radio came with a 4.8 V, 700 mA H battery, which provides 1.5 W in the high-power setting. Most, but not all, users got several days of use from a single charge. Most considered battery life above average.

Indicative of the quality built in to this H-T is the metal belt clip. Although it's a minor point, one reviewer commented, “I especially like it because the radio is secure on my purse, too.” Another called the controls “very solid.” The rubber dust covers for the speaker/mike and dc jacks stayed in place, too—not the case with all the radios we looked at.

Programming a memory channel on this radio involves five steps but was judged to be relatively simple. One user called it “a snap.” Setting the various functions takes a bit of getting used to, but the manual is generally clear and well organized. One reviewer called the DJ-190T “very easy to use” once it's set up. Several others shared that senti-

Alinco DJ-190T, serial number T001221

Manufacturer's Specifications

Frequency coverage: Receive, 136-174 MHz; transmit, 144-148 MHz.

Power requirements: 4.8-13.8 V dc.
Receive, ≈ 50 mA; transmit (max, high power), ≈ 1.5 A at 13.8 V dc.

Size (HWD); 5.75 \times 2.25 \times 1 in; weight 11.4 oz.

Receiver

FM sensitivity, 12 dB SINAD: 0.16 μ V.

Two-tone, third-order dynamic range: Not specified.

Adjacent channel rejection: Not specified.

First IF and image rejection: Not specified.

Squelch sensitivity: Not specified.

S-meter sensitivity: Not specified.

Audio output: 200 mW at 10% THD into 8 Ω .

Transmitter

Power output (H/L): Power levels with EBP37N 4.8 V battery pack, not specified; ≈ 5 W / ≈ 0.6 W at 13.8 V dc.

Spurious signal and harmonic suppression: 70 dB.

Transmit-receive turn-around time (PTT release to 50% of full audio output): Not specified.

Receive-transmit turn-around time (“tx delay”): Not specified.

Note: All dynamic range measurements were made at the ARRL Lab standard spacing of 20 kHz.

*Measurement was noise-limited at the value shown.

Measured in the ARRL Lab

Receive, 130-174 MHz; transmit, as specified.

As specified.

Receiver Dynamic Testing

For 12 dB SINAD: 0.15 μ V.

20 kHz offset, 58 dB; * 10 MHz offset, 68 dB.
59 dB.

IF rejection, 114 dB, image rejection, 67 dB.

At threshold, 0.19 μ V.

Max indication= ≈ 3.8 μ V.

245 mW at 15% THD into 8 Ω .

Transmitter Dynamic Testing

2.0 W / 1.0 W with EBP37N, 4.8 V battery pack;
6.5 W / 1.0 W at 13.8 V dc.

72 dB. Meets FCC requirements for spectral purity for equipment in its power output class and frequency range.

Squelch off, S9 signal, 40 ms.

75 ms.



ment. Still, there were some rough spots. Adjusting the squelch involves holding down two buttons on the left side while rotating the single control knob. This takes a bit of practice and dexterity. The labels on these three critical side buttons are difficult to read, which can lead to some initial programming confusion.

Users got good reports on transmitted audio—most stations contacted reported it was loud and clean. Received audio is ample, with just some distortion at the highest volume setting. As Alinco has done on some earlier models, including the DJ-191, this H-T uses up and down pushbuttons to adjust the volume. These buttons double in brass for other functions. The volume control is the default, so setting it just right is simple. The display reads out the relative level (0-31).

The 28-page *Instruction Manual* is well-illustrated and nicely designed, but some reviewers thought it could have been written more clearly. It contains a detailed table of contents and a quick reference section, both helpful in finding specific information quickly. The manufacturer included a schematic diagram.

One noteworthy feature is what Alinco calls cable cloning. To transfer the entire memory contents from one DJ-190T to another, you just need a couple of mini stereo plugs and some cable. The few easy steps are described clearly in the manual.

Alinco says the DJ-190T also provides for

PC cloning/programming, which requires optional third-party software. RT Systems (800-723-6922) offers the software and cable, item code APK-1, for \$35. (This also works with the DJ-191T.)

Nearly everyone on the review team expressed disappointment at the lack of a keypad, but no one missed the paging function (available on most of the other radios in the test group). The absence of the tone pad also seemed to be why most major dealers were not regularly stocking the DJ-190T, but they might want to rethink that philosophy. Our users *liked* the back-to-basics design with a minimum of bells and whistles. "Everything the average user would want," one tester said. As it stands now, you'll very likely have to shop around to locate a DJ-190T, and even then it might have to be a special order item.

The lack of the keypad aside, those looking for basic communication might find the DJ-190T just what they need in an H-T.

Manufacturer: Alinco Electronics, 438 Amapola Ave, No 130, Torrance, CA 90501; tel 310-618-8616; fax 310-618-8758; e-mail alinco@alinco.com; <http://www.alinco.com>. Manufacturer's suggested retail price, \$219.

ALINCO DJ-S11T

At first blush, the Alinco DJ-S11T "mini power transceiver" almost seems *too* small and *too* simple. But the DJ-S11T is no mere novelty. It's the smallest radio in the pack, has a small, fixed telescoping antenna, uses three AA cells (you can use NiCds too), has

no keypad, not much of a manual (it barely qualifies as a *brochure*), and puts out about 300 mW. Yes, this is the "most basic" model referred to earlier! It's also the least expensive. I'm not sure if I can explain why, but given a chance to prove itself, this radio grows on you. In any event, it keeps a low profile and weighs in at just over 7 ounces.

Some of the features packed into this tiny frame include an external power jack, external mike and speaker jacks, monitor function, simple change between VFO and memory modes, lamp, auto power off, high and low power (yes, 50 mW!), scan, shift and call functions, alarm, courtesy beep, key-stroke beep, CTCSS encoder, offset shift indicator and channel display mode.

Reviewers gave the display good marks, considering its small size. It can be illuminated. They especially liked the fact that you can run the DJ-S11T for quite a while on a fresh set of AA cells (it has an automatic battery saver function). Audio output was deemed to be on the low side, leading several reviewers to suggest an external speaker mike for mobile use or in a noisy environment. Users noted a fair amount of distortion at the highest volume setting.

For such a small, light radio, overall quality is very good. On the downside, the built-in "fold-out" nine-inch telescoping antenna can flop over on occasion when fully extended. There's no way to connect the unit to an external antenna either, which complicated testing somewhat and will likely con-

Alinco DJ-S11T, serial number T003447C

Manufacturer's Specifications

Frequency coverage: 144-148 MHz, receive and transmit.

Power requirements: 3.6-5.5 V dc. Receive, \approx 33 mA; transmit, \approx 260 mA at 4.5 V dc.

Size (HWD); 3.9 \times 2.1 \times 1 in; weight 7.1 oz.

Receiver

FM sensitivity, 12 dB SINAD: 0.18 μ V.

Two-tone, third-order dynamic range: Not specified.

Adjacent channel rejection: Not specified.

First IF and image rejection: Not specified.

Squelch sensitivity: Not specified.

S-meter sensitivity: Not specified.

Audio output: 100 mW at 10% THD into 8 Ω .

Transmitter

Power output (H/L): 0.34 W at 4.5 V dc (3 \times AA batteries); low power, 0.05 W; with external supply, not specified.

Spurious signal and harmonic suppression: Not specified.

Transmit-receive turn-around time (PTT release to 50% of full audio output): Not specified.

Receive-transmit turn-around time ("tx delay"): 108 ms. Not specified.

Note: All dynamic range measurements were made at the ARRL Lab standard spacing of 20 kHz.

Measured in the ARRL Lab

As specified.

As specified.

Receiver Dynamic Testing

For 12 dB SINAD: 0.19 μ V.

20 kHz offset, 56 dB; 10 MHz offset, 55 dB.

59 dB.

IF rejection, 88 dB, image rejection, 57 dB.

At threshold, 0.15 μ V.

Max indication=1.5 μ V.

101 mW at 10% THD into 8 Ω .

Transmitter Dynamic Testing

0.3 W / 0.1 W with 3 \times AA batteries; 0.3 W / 0.1 W at 5.5 V dc.

54 dB. Meets FCC requirements for spectral purity for equipment in its power output class and frequency range.

Squelch off, S9 signal, 300 ms.



tribute to mixed success on the air. Alinco says it's looking into this issue.

Programming this radio was more of a chore than with some of the others, but most users found it got much easier with practice. The instruction sheet, which can charitably be called sketchy, was one contributing factor. The word "squench" does not appear on the sheet, for example; if there's a way to set the squelch level, Alinco is keeping it to themselves. (No one complained that the squelch didn't work, however; Alinco confirms that it's not user-settable.) Entering a frequency into memory involves just three steps. To access a function, a key may be pressed either alone or at the same time the **FUNCTION** key is pressed. You can access other functions by holding down a key while turning on the power. Other programming functions were judged to be a bit more complicated than on some other radios in the group.

The relatively low power output of the DJ-S11T—coupled with the minimal antenna—made it difficult to impossible to hit some repeaters in this region. Most users felt a better antenna would have compensated for the flea-power transmitter. Once we'd "made the machine," reports varied. For example, one station would report that I was breaking up a bit, while another time I'd be solid copy. Transmit audio was reported to be good. At the low output power setting, it was difficult to hit repeaters more than a mile or so away. Use of a more efficient external antenna would help, of course, but there's no way to do it.

One somewhat unusual feature is the telephone-style "alerting ring" on transmit that sounds for all the world like an electronic telephone ring. You can use it to get the attention of another station. Just press the **UP** or **DOWN** key (this can be switched to the 1750-Hz tone burst used in Europe). You can enable an alarm that sounds when a signal is received, too. Some found the alerting tones tended to confuse—and sometimes annoy—both users and those they contacted. They can be disabled, however.

Despite its insubstantial nature, the instruction sheet even includes a schematic diagram, a couple of illustrations, a quick reference chart, and instructions in four other languages besides English. The type is small, though, and some reviewers had difficulty reading it.

Alinco says cable cloning is available for the DJ-S11T, something our manual didn't mention. Alinco says the manual has been revised to reflect this change. The manufacturer also says it plans to offer PC cloning for the DJ-S11T. This will require optional software that was not available when this review went to press.

Overall, reviewers especially liked the small size of this radio. With the antenna folded down, it fits easily into a shirt pocket, in a purse, or on a belt (with the supplied clip). On the other hand, reviewers missed a "real" manual, the ability to connect to an external antenna, and more power output.

The DJ-S11T might be more useful as a

backup H-T, particularly if you do most of your operating either near a repeater with good "ears" or on simplex—at Field Day, while hiking, or talking across the hamfest, for example. Those who primarily operate mobile or routinely need to hit a distant repeater would probably want to look elsewhere.

Manufacturer: Alinco Electronics, 438 Amapola Ave, No 130, Torrance, CA 90501; tel 310-618-8616; fax 310-618-8758; e-mail alinco@alinco.com; <http://www.alinco.com>. Manufacturer's suggested retail price, \$149.

ICOM IC-T2A

The IC-T2A is a sturdy and well designed radio that has a lot to offer—but you may need help getting it up and running because there are few labels on the controls. That's because the IC-T2A is user programmable. If you don't like the default controls, you can, as one user put it, "roll your own."

The display is one of the smallest in the group. The frequency and memory channel are prominent, but the other flags aren't, particularly in bright sunlight or at an angle. The display is lighted for nighttime use, but the tone pad isn't. One handy feature: the lamp stays on for 5 seconds after the radio is turned on.

The comparatively high audio power paid dividends in the IC-T2A. Reviewers were uniformly positive about the received sound quality, even at highest volume setting. Transmitted audio reports received were good to excellent.

ICOM IC-T2A, serial number 01215

Manufacturer's Specifications

Frequency coverage: Receive, 136-174 MHz; As specified.
transmit, 140-150 MHz.

Power requirements: 9.6 V dc. Receive, standby ≈65 mA; transmit (max, high power), ≈1.4 A.

Size (HWD); 5.5×2.25×1.4 in; weight 14.4 oz.

Receiver

FM sensitivity, 12 dB SINAD: 0.18 μV.

Two-tone, third-order dynamic range: Not specified.

Adjacent channel rejection: Not specified.

First IF and image rejection: Not specified.

Squelch sensitivity: 0.18 μV

S-meter sensitivity: Not specified.

Audio output: 350 mW at 10% THD into 8 Ω.

Transmitter

Power output (H/L): 4.5 W / 1 W with BP194 battery tray; with external supply, not specified.

Spurious signal and harmonic suppression: 60 dB.

Transmit-receive turn-around time (PTT release to 50% of full audio output): Not specified.

Receive-transmit turn-around time ("tx delay"): 144 ms. Not specified.

Note: All dynamic range measurements were made at the ARRL Lab standard spacing of 20 kHz.

Measured in the ARRL Lab

As specified.

Receiver Dynamic Testing

For 12 dB SINAD: 0.15 μV.

20 kHz offset, 53 dB; 10 MHz offset, 73 dB.

51 dB.

IF rejection, 94 dB, image rejection, 116 dB.

At threshold, 0.13 μV.

S9=0.8 μV.

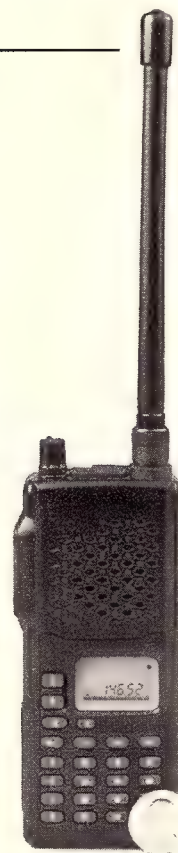
361 mW at 10% THD into 8 Ω.

Transmitter Dynamic Testing

4.2 W / 0.8 W with BP194 battery tray (8×AA NiCd's); 4.2 W / 0.8 W at 9.6 V dc.

67 dB. Meets FCC requirements for spectral purity for equipment in its power output class and frequency range.

Squelch off, S9 signal, 175 ms.



The supplied BP-194 battery case contains eight individual AA NiCd cells instead of the typical monolithic battery pack. ICOM says it should last 3.5 hours between charges, but there is a battery saver function to help extend that. You can replace the NiCds with alkalines for a bit more power output if you want—not that you'll necessarily need it. At more than 4 W, the output power of our IC-T2A was the highest of the seven units we looked at while running off the internal batteries.

As for ruggedness, the radio got high marks. While one reviewer thought it was a bit on the heavy side (at just over 14 ounces, it's the heaviest of the bunch), everyone liked how it felt in the hand. A couple of users compared it to a commercial radio in look and feel.

Figuring out the default button functions requires reading the *Instruction Manual* or knowing how to use the built-in Guide—which is like the "Help" file on a PC program. This is how I learned that the default setting for **P1** is the scan button, and that the default **A** button toggles between VFO and memory modes. The Guide system is contextual. Pressing a key after pressing the # key provides a description of that key's function as "crawl text" on the full display. ICOM says it now offers a free pocket guide "to simplify customizing." IC-T2A owners can write ICOM for a copy.

Once you get the hang of programming, the radio provides lots of flexibility. If you like to program, you'll have fun with this one. The neat thing about it is that you can custom-

ize eight buttons, P0 through P4 and A through D, to handle functions you use a lot. Once you've customized a button, the radio's Guide function is there to remind you what you've programmed. Very nice! Programming a frequency into a memory requires five steps.

The 40-page manual sports nice looking drawings and tables that make it easy to follow. There is no schematic diagram.

Although you don't want to activate a push-to-talk button accidentally, this one requires more pressure than the others. As with a stick shift in heavy traffic, operating the PTT when you're having a lengthy conversation with short segments can be tiring.

One reviewer experienced an anomaly that others didn't. The transceiver locked up twice, and nothing short of resetting everything could get it out of the locked-up condition.

One potentially useful feature is cloning. With optional software and a cloning cable (CS-T2 software; OPC-474 or OPC-478 cable from ICOM), the programmed contents of one IC-T2A can be transferred to another, as well as from a PC to the IC-T2A. This also enables use of the ANI (automatic number identification) mode, a selective calling system that's similar to paging. The IC-T2A is the only transceiver in this group to offer tone scan capability.

If you're not satisfied with "cookie cutter" H-Ts but enjoy programming and learning to use advanced functions, this radio might very well cut the mustard for you.

Manufacturer: ICOM America Inc, 2380

116th Ave NE, Box C-90029, Bellevue, WA 98004; tel 425-454-8155; fax 425-454-1509; e-mail 75540.525@compuserve.com (tech support); <http://www.icomamerica.com>. Manufacturer's suggested retail price, \$227.

KENWOOD TH-235A

This definitely no-frills H-T includes a tone pad, but it offers a minimum of buttons and controls for ease of operation. It's the tallest unit of the group (not counting the rubber ducky).

The display is small, which means some display symbols and icons are too small to be seen easily. The important stuff—the frequency and memory address—is sufficiently large and clear if viewed straight on. Viewing the small stuff at an angle is a challenge under all lighting conditions. The display can be illuminated for nighttime viewing.

Our unit came with a 7.2 V, 950 mA NiCd battery pack—pretty generous for an economy model H-T. Most users considered battery life good to excellent. At a full charge, our review radio cranked out 1 W more than its 1.5 W specified output. That's a healthy bonus.

Because this radio is so devoid of the controls that bristle from most other H-Ts, it almost looks generic. Okay, so maybe it's not exciting to look at, but apparently Kenwood's thinking here was that most hams prefer useful features and good quality to head-turning looks. Fit and finish are good, with one exception: The review radio's tuning control

Kenwood TH-235A, serial number 80905312

Manufacturer's Specifications

Frequency coverage: 144-148 MHz, receive and transmit.

Power requirements: 7.5-16 V dc. Receive, ≈ 50 mA; transmit (max, high power), ≈ 1.3 A at 12 V dc.

Size (HWD): 6 \times 2.25 \times 1.25 in; weight 12.9 oz.

Receiver

FM sensitivity, 12 dB SINAD: 0.2 μ V.

Two-tone, third-order dynamic range: Not specified.

Adjacent channel rejection: Not specified.

First IF and image rejection: Not specified.

Squelch sensitivity: 0.13 μ V

S-meter sensitivity: Not specified.

Audio output: 280 mW at 10% THD into 8 Ω .

Transmitter

Power output (H/L): 1.5 W / 1 W with PB36, 7.2 V battery pack; 5 W / 1 W at 13.8 V dc.

Spurious signal and harmonic suppression: 60 dB.

Transmit-receive turn-around time to 50% of full audio output: Not specified.

Receive-transmit turn-around time ("tx delay"): Not specified.

Note: All dynamic range measurements were made at the ARRL Lab standard spacing of 20 kHz.

*Measurement was noise-limited at the value shown.

Measured in the ARRL Lab

Receive, 136-174 MHz; transmit, 144-148 MHz.

As specified.

Receiver Dynamic Testing

For 12 dB SINAD: 0.14 μ V.

20 kHz offset, 63 dB; * 10 MHz offset, 80 dB.

61 dB.

IF rejection, 98 dB, image rejection, 133 dB.*

At threshold, 0.10 μ V.

No signal strength indicator.

451 mW at 10% THD into 8 Ω .

Transmitter Dynamic Testing

2.5 W / 1.0 W with PB36, 7.2 V battery pack; 4.7 W / 1.0 W at 13.8 V dc.

64 dB. Meets FCC requirements for spectral purity for equipment in its power output class and frequency range.

Squelch off, S9 signal, 105 ms.

38 ms.



knob could easily be pulled off (and perhaps lost if it should be removed by a youngster). The secondary labels present on most other radios in this group are nearly absent, which means you'll need to keep the manual nearby until you memorize the functions.

The review team found that programming the TH-235A was a pleasure. It involves just three steps. This was deemed the simplest of all the radios in this review group to program. As one user enthused, "I was on the repeater within 60 seconds of removing it from the box." Other functions (the ones that use keys with labels, that is) are intuitive. Once programmed, the radio works very well indeed. "Can't be any easier," one user declared.

Reports on transmitted audio were a mixed bag. Some of those contacted reported strong, clear signals, while a few reported low or less-than-natural sounding voice quality. This radio supplies more than 400 mW of audio to its little speaker, so there's lots of receive audio, but the unit can distort at high volume.

The nicely illustrated *Instruction Manual* has a great quick start section plus an index but no separate quick reference guide, which some users missed. Kenwood says a quick reference adhesive label for the TH-235A is available upon request. Drawings are professionally rendered, making it simple to follow the instructions. Tables are likewise clear and straightforward. One user called it the best manual of the group. There is no schematic diagram, but Kenwood says the optional

TH-235A *Service Manual* includes one.

Overall, reviewers liked this radio for its simplicity. "As basic as I have seen and no problem to use," summed up one user. The memory-to-VFO transfer capability is impressive. Simply pressing the **F** and **VFO** buttons transfers the complete contents of the memory channel to the VFO. As the manual points out, this is useful while searching for other stations or for a clear frequency near the selected memory channel.

Manufacturer: Kenwood Communications Corp, 2201 E Dominguez St, Box 22745, Long Beach, CA 90801-5745; tel 310-639-5300; fax 310-631-3913; <http://www.kenwood.net>. Manufacturer's suggested retail price, \$230.

MIDLAND 73-030

Back in the early days of VHF repeaters, Midland offered some crystal-controlled and synthesized mobile transceivers (the company still has a following among CBers). Now, Midland is back in the amateur market with (among other products) this 2-meter H-T, which the manual touts as a "palm size FM paging transceiver." And that it is. This comfortably compact unit will also fit in a shirt pocket, although it's heavy enough to remind you it's there.

Midland says this transceiver has been available in Europe for some time now, but it's not well known in the US. In fact, we had trouble finding a dealer that regularly stocks the 73-030. Even the dealer that sold us our

unit has since discontinued carrying it, so you could have trouble getting your hands on one. Midland says it's working to change this situation.

The 73-030 has a traditional **PWR/VOL** knob at the top, next to the not-so-traditional **ENC/SQL** (tuning and squelch) dial. This H-T also has a tone pad with small but well separated buttons. A bit puzzling is the tone key labeled **FM** (the #7 key on the keypad) that allows the various controls to be set. When **FM** is pushed, a tiny **F** (for "function," one can assume) appears in the display.

Reviewers found the display small but legible; it has good-sized numbers, but some "over 40" reviewers had difficulty reading the smaller legends. The tone pad is backlit for clear visibility at night.

On transmit, most stations gave very good or excellent reports on transmitted audio, but a couple of testers got reports that audio was "muffled" when close-talked, and others got reports that audio was "a bit low." Audio output on receive was judged to be above average, particularly for a small speaker. "Output was great, even at full volume in a noisy environment" raved one reviewer.

Battery life was likewise excellent—one reviewer used it for an hour a day for a week and didn't need to charge the battery pack. The supplied NiCd battery pack is rated at 6 V at 600 mAH.

The H-T has a solid feel to it and strongly resembles the Kenwood TH-22AT we reviewed last year. Controls and buttons are

Midland 73-030, serial number 550059

Manufacturer's Specifications

Frequency coverage: 144-148 MHz, receive and transmit.

Power requirements: 5.0-13.8 V dc.

Receive (squelched), ≈42 mA; transmit (max, high power), ≈1.5 A at 13.8 V dc.

Size (HWD); 4.5×2.1×1 in; weight 10.4 oz.

Receiver

FM sensitivity: 12 dB SINAD, 0.16 μV.

Two-tone, third-order dynamic range: 60 dB.

Adjacent channel rejection: 64 dB.

First IF and image rejection: Not specified.

Squelch sensitivity: Not specified.

S-meter sensitivity: Not specified.

Audio output: 200 mW at 10% THD into 8 Ω.

Transmitter

Power output (H/M/L): With RNB127

6-V battery pack, not specified;

5 W / 0.6 W / 0.18 W at 11 V dc.

Spurious signal and harmonic suppression: 60 dB.

Transmit-receive turn-around time (PTT release to 50% of full audio output): Not specified.

Receive-transmit turn-around time ("tx delay"): 84 ms. Not specified.

Note: All dynamic range measurements were made at the ARRL Lab standard spacing of 20 kHz.

*Measurement was noise-limited at the value shown.

Measured in the ARRL Lab

Receive, 136-174 MHz; transmit, 144-148 MHz.

As specified.

Receiver Dynamic Testing

For 12 dB SINAD: 0.16 μV.

20 kHz offset, 58 dB; * 10 MHz offset, 68 dB.

59 dB.

IF rejection, 76 dB, image rejection, >146 dB.

At threshold, 0.04 μV.

Max indication=4.4 μV.

245 mW at 10% THD into 8 Ω.

Transmitter Dynamic Testing

2.8 W / 0.6 W / 0.2 W with RNB127, 6 V battery

pack; 5.6 W / 0.6 W / 0.2 W at 11 V dc.

66 dB. Meets FCC requirements for spectral purity for equipment in its power output class and frequency range.

Squelch off, S9 signal, 42 ms.



well placed and work easily. The speaker mike and dc jack dust covers stayed put when closed, and the radio provides a sturdy metal belt clip. On our review unit, the small plate surrounding the dc jack (it's glued in place) came loose. Otherwise, fit and finish were excellent.

Programming also got high marks from the reviewers. One quirk was the use of the letter **A** in the display to indicate VFO mode. There's no explanation of what **A** stands for. Programming a memory channel involves four steps. After you're done, the H-T automatically returns to VFO mode. Once programmed, the radio was deemed easy to use.

Owing to the H-T's many features and functions, the 56-page manual is larger than most. A *Quick Reference Guide* is printed on heavy card stock, which is helpful. The manual itself contained a few annoying typographical errors, but it's easy to figure out the intent of the words. There is no schematic diagram.

Of special note is the automatic battery saver function. The radio "sleeps" but awakens every 250 ms to check for activity. One reviewer with large hands reported that his pinkie tended to wrap all the way around to the front **MR** button, which activates the memory mode. Those with smaller hands had no such problems. One commented, "I took it out walking each night, and I found it comfortable in hand."

One reviewer found that an incorrect frequency occasionally appeared on the display.

"When working a local repeater, the radio was set to 147.39 on receive and 147.99 on transmit. Sometimes, after transmitting, the display would stay at 147.99, even though it was receiving perfectly fine on 147.39." A low battery could have been the culprit here.

Another reviewer reported that when the radio was in memory mode, he could inadvertently change the memory without realizing it. The Midland 73-030 offers expanded receive coverage right out of the box.

Considering the largely positive impression the unit made on our users, more retailers should seriously consider putting the 73-030 on their shelves. By the way, Midland also makes the larger Model 73-005A, which offers a different variety of features.

Manufacturer: Midland Consumer Radio, 1670 North Topping, Kansas City, MO 64120; tel 816-241-8500; fax 816-241-5713. Manufacturer's suggested retail price, \$370.

STANDARD C156A

Standard has a history of making some small H-Ts. In the past, we've looked at the diminutive C108 2-meter H-T and, more recently, the C508 dualbander. A palm size radio with a tone pad, two knobs on top and three on the side, including a function button, the little C156A is both simple and fun to use and has lots of nice features. This is a very well-built, handsome radio with the excellent fit and finish that Standard owners have come to expect. The only minor gripe in

that regard was that the rubber dust covers over the jacks didn't stay put once they'd been opened. Standard says it's fixed this problem in current production models.

In general, this H-T feels rugged and fits well in the hand. The display panel is easy to read in all but the brightest sunlight. The lamp lights the display but not the keypad buttons.

Audio output was quite good, even at high volume. "There were no distortion, rattles or vibration," one reviewer reported. Transmitted audio quality got mixed reviews from stations the reviewers contacted. Although some noted "clear and strong" reports, several others got "does not sound like your usual voice" and "very low in pitch and a little muffled." One user cured the "muffled" audio by backing away from the mike a bit.

The battery pack, which holds four AA alkaline cells, held up well over the course of our testing. This could vary from one battery brand to another, however.

The radio is a good fit in a shirt or pants pocket, even with the antenna attached. One drawback is the small size of the Function button on the side. Considering that it's used fairly often, users felt that a larger button would have been more convenient. There were some complaints about the lack of a squelch knob—but the C156A has an automatic squelch system, so the control is superfluous. There is a **MONITOR** button, however.

Ease of programming this radio got mixed reviews. One experienced H-T user called it

Standard C156A, serial number 66U020176

Manufacturer's Specifications

Frequency coverage: Receive and transmit, 144-148 MHz.

Power requirements: 4.0-15 V dc.

Receive, ≈ 30 mA; transmit (max, high power), ≈ 1.3 A at 13.8 V dc.

Size (HWD); 5x2.1x1 in; weight 10.6 oz.

Receiver

FM sensitivity, 12 dB SINAD: 0.16 μ V.

Two-tone, third-order dynamic range: Not specified.

Adjacent channel rejection: Not specified.

First IF and image rejection: Not specified.

Squelch sensitivity: 0.10 μ V

S-meter sensitivity: Not specified.

Audio output: 250 mW at 10% THD into 8 Ω .

Transmitter

Power output (H/M/L): 1.8 W / 0.35 W with CBT156, 6 V battery tray; 5 W / 2.5 W / 0.35 W at 13.8 V dc.

Spurious signal and harmonic suppression: 60 dB.

Transmit-receive turn-around time (PTT release to 50% of full audio output): Not specified.

Receive-transmit turn-around time ("tx delay"): Not specified.

Note: All dynamic range measurements were made at the ARRL Lab standard spacing of 20 kHz.

*Measurement was noise-limited at the value shown.

Measured in the ARRL Lab

Receive, 100-196 MHz; with reduced sensitivity below 137 MHz and above 174 MHz; transmit, as specified. As specified.

Receiver Dynamic Testing

For 12 dB SINAD: 0.13 μ V.

20 kHz offset, 59 dB; * 10 MHz offset, 66 dB.

58 dB.

IF rejection, 89 dB, image rejection, 66 dB.

At threshold, 0.09 μ V.

S9=2.8 μ V.

281 mW at 10% THD into 8 Ω .

Transmitter Dynamic Testing

1.8 W / N/A / 0.4 W with CBT156, 6 V battery tray; 5.0 W / 2.2 W / 0.4 W at 13.8 V dc.

65 dB. Meets FCC requirements for spectral purity for equipment in its power output class and frequency range.

Squelch off, S9 signal, 27 ms.

76 ms.



"worse than average." Most agreed it was no better than average and they needed to refer frequently to the manual. "Much use of the function button," another user remarked. To program a frequency into memory involves four steps. Switching between memory and VFO mode is easy—the large **V/M ENT** button on the front panel toggles between them.

This is the only unit in the group that has memory naming—and it has the most memories to name, too. You can apply up to seven character names or titles to the unit's 100 memory channels.

The well-organized manual covers 80 pages and includes an index. A couple of experienced H-T users felt it lacked some necessary details (such as information about extended receive coverage), however, and one lambasted the awkward translated English. The first section covers Basic Operations, and the remainder Advanced Operations. "This one tells how to get into a function and how to get out of it," one reviewer commented. Another reviewer became puzzled at first by the musical tones at the end of some transmissions; it turned out to be a low-battery indicator that's undocumented in the manual. The manual includes a troubleshooting section. Illustrations are large enough to show necessary detail. There is no separate quick reference guide or schematic diagram.

This radio seems rugged enough to stand up to repeated use, and our reviewers really appreciated the size and feel of this H-T.

Manufacturer: Standard Amateur Radio Products, Box 48480, Niles, IL 60714; tel 773-763-0081; fax 773-763-3377; <http://www.stdradio.com>. Manufacturer's suggested retail price, \$289.

Summary

If I had to provide one piece of advice based on a close look at these seven H-Ts, it would be this: Don't be seduced by the number of features and functions a particular model offers. Instead, look at the capabilities of each model, and decide which has the features you're likely to use. More bells and whistles *do not* necessarily equate to more operating enjoyment if you don't use them!

A couple of comments are worth noting here. Except for the Kenwood TH-235A, there was nothing in the manuals about using these radios for packet operation. And there's nothing on the boxes—or even in the manuals in most cases—about ham radio! The radios are described as "VHF FM transceivers," or some variant thereof, but there is no indication that they are to be used in the Amateur Radio Service, or that a license is required to transmit on the ham bands.

Overall, these radios represent a terrific cross-section of features and operating convenience, and at a cost that won't bust your budget. Some manufacturers have clearly succeeded better than others, but these seven H-Ts, each with its own personality, are marvels of engineering and electronics. While I was using these radios, I found that

I didn't miss my old, heavy and very, very basic H-T. In fact, I'm not even sure where I put it. I may just have to replace it...

SOLICITATION FOR PRODUCT REVIEW EQUIPMENT BIDS

[In order to present the most objective reviews, ARRL purchases equipment off the shelf from dealers. ARRL receives no remuneration from anyone involved with the sale or manufacture of items presented in the Product Review or New Products columns.—Ed.]

The ARRL-purchased Product Review equipment listed below is for sale to the highest bidder. Prices quoted are minimum acceptable bids, and are discounted from the purchase prices. All equipment is sold without warranty.

Drake TR270 2-meter transceiver with TNC270, (see "Product Review," Nov 1997 *QST*). Minimum bid: \$825.

ICOM-IC-756 MF/HF/VHF transceiver with narrow CW filters, (see "Product Review," May 1997 *QST*). Minimum bid: \$1683.

SSB Electronic LT2S Mk II 2-meter transverter, (see "Product Review," Nov 1997 *QST*). Minimum bid: \$587.

Ten-Tec OMNI VI Plus MF/HF trans-

ceiver with 500-Hz CW filters, (see "Product Review," Nov 1997 *QST*). Minimum bid: \$1954.

Sealed bids must be submitted by mail and must be postmarked on or before January 1, 1998. Bids postmarked after the closing date will not be considered. Bids will be opened seven days after the closing postmark date. In the case of equal high bids, the high bid bearing the earliest postmark will be declared the successful bidder.

In your bid, clearly identify the item you are bidding on, using the manufacturer's name and model number, or other identification number, if specified. Each item requires a separate bid and envelope. Shipping charges will be paid by ARRL. Please include a daytime telephone number. The successful bidder will be advised by telephone with a confirmation by mail. No other notifications will be made, and no information will be given to anyone other than successful bidders regarding final price or identity of the successful bidder. If you include a self-addressed, stamped postcard with your bid and you are not the high bidder on that item, we will return the postcard to you when the unit has been shipped to the successful bidder.

Please send bids to Bob Boucher, Product Review Bids, ARRL, 225 Main St, Newington, CT 06111-1494. **QST**

New Products

EXTREME-DUTY SURGE PROTECTORS FROM ELECTRONIC SPECIALISTS

◊ Electronic Specialists' new line of extreme-duty surge protectors is designed for 125, 250 and 125/250-V power systems with 15, 20 and 30-A loads. Installed between the power line and the load, the new protection units incorporate heavy-duty

surge fusing to further reduce the risk of damage to connected equipment.

Protection capabilities range from 136,500 surge amps (15-A device) to 253,500 surge amps (30-A device). All models incorporate 1 picosecond suppression to protect against sub-nanosecond spikes.

Prices start at \$135. For more information, contact Electronic Specialists at 171 S Main St, Natick, MA 01760; tel 800-225-4876, fax 508-653-0268, e-mail clipprx@ix.netcom.com; <http://www.electspec.com>.

CODE QUICK 2000 ON CD-ROM

◊ New from Wheeler Applied Research is the CD-ROM version of *Code Quick 2000*, a Windows 95-compatible program that uses sounds, cartoons and icons to help students learn Morse code.

Features include calibrated 2-23 WPM Morse code characters sent through your PC's internal speaker or sound card; a detailed user guide and help file; 999 practice QSOs; 999 VE-type practice exams; and a complete set of Novice through Extra-class theory questions.

Price: \$39.95 prepaid (\$34.95 via the internet). Upgrade and bundle pricing is available. For more information, contact Wheeler Applied Research at 800-782-4869; <http://www.codequick.com>. **QST**



REWINDING RELAYS FOR 12 V OPERATION

[In recent months, there have been some great changes in the League's experimenter's publication, *QEX*. Rudy Severns, N6LF, is the new Editor, and I have assumed the Managing Editor duties. We are widening the scope of the magazine considerably. While *QEX* will still carry cutting-edge material in several areas of Amateur Radio, you'll find other articles from a wide range of technical topics at various levels. If you like to build, or read about building, join up!

As an example of the good stuff in *QEX*, the following hint was a sidebar in Paul Wade's 5760 MHz transverter article in the November 1997 *QEX*. Other hints have presented seat-of-the-pants solutions to adapt various relays for 12-V operation, but this treatment casts aside experimental tactics in favor of an engineering approach.—Ed.]

◊ Microwave operation from high places requires portable operation for most of us. The most convenient power source is usually the 12 V battery in the vehicle that gets us there, and modern solid-state devices work fine at 12 V, or less. Most surplus coax relays, however, are designed for operation at 28 V or more and don't switch reliably at 12 V. When available, 12 V coax relays are exorbitantly priced; so it would be nice if the higher-voltage relays could be converted. Since relays are ancient technology, digging through some ancient issues of *QST* yielded an article¹ that detailed the calculations necessary to rewind relays for different voltages. I will summarize them here because the back issue is probably no longer available.

Ham folklore says it is only necessary to remove turns from the coil until it works at 12 V. I'm told this often works for 28 V relays, but let's go through the numbers and see how well.

Calculations

The relative force generated by the coil to close a relay is conveniently measured in ampere-turns, simply the current through the coil times the number of turns. If we are rewinding a relay, rather than count thousands of turns, we can simply fill the bobbin with wire and assume that the volume of wire is constant.

Using this assumption and standard US

wire gauge (AWG) sizes simplifies the equations. The AWG wire diameters decrease geometrically with increasing AWG number, so that each size is approximately 1.12 times (or $10^{0.05}$) smaller than the preceding size. Using this relationship, we can calculate the number of turns per square inch, N , of bobbin cross section changes by a factor of $10^{0.1}$, or 1.26, per wire size, and the resistance, R , per cubic inch of winding changes by a factor of $10^{0.2}$, or 1.59, per wire size.

Since we are rewinding the same bobbin, area and volume are constant (k), so

$$N^2/R = k$$

Multiplying by I^2/I^2 , this becomes:

$$(NI)^2/I^2R = k$$

we can recognize NI as ampere-turns and I^2R as watts, or power.

This means that—for any wire size that fills the bobbin—the same amount of power applied provides the same number of ampere-turns. So, we need to calculate the wire size that will draw the same power at the desired voltage:

$$V_1^2/R = V_2^2/R$$

If V_1 is the original (higher) voltage and V_2 is 12 V, then we must increase the wire diameter by:

$$\text{number of wire sizes} = 10 \log(V_1/V_2)$$

Remember that a larger diameter wire has a smaller AWG number. The original article had a graph, but we can easily solve this on a pocket calculator, *which they didn't have in 1956*. I've summarized the most common voltages in the following table:

Common Relay Voltages

Original	Desired	# of wire sizes
28 V	12 V	4
48 V	12 V	6
115 V	12 V	10

Procedure

The rewinding procedure is straightforward: Peel the old wire off the bobbin, measure the wire size and rewind it with larger magnet wire as calculated above. Radio Shack carries several sizes of magnet wire, which may include the one you need. Mechanical details should be much like the original relay; take notes during disassembly. The most difficult part is often prying the bobbin off the metal pole.

Relays in sealed cans are a larger problem, and I welcome suggestions.

The fastest way to wind the new coil is to wrap masking tape around a dowel or pencil until the bobbin fits snugly over it. Then chuck the pencil (with the bobbin) in a variable-speed drill or lathe and run it *slowly* to wind the wire on. At *low* speeds, it's safe to guide the wire with your fingers.

Example

I found several excellent coax relays with N-connectors at a hamfest, quite cheap because they required 48 V. They were wound with #38 AWG wire. From the equation, converting from 48 to 12 V requires wire roughly six gauges larger, so I rewound one with #32 AWG wire. The original winding required 48 V at 54 mA, pulled in at 35 V and released at 15 V. After rewinding, it draws 265 mA at 12 V, pulls in at 8.5 V, and releases around 2 V. The power consumed is slightly higher now, because six wire sizes is an approximation, but I can be sure it will still operate on a low battery. My 903 MHz station now runs entirely on 12 V.

The SMA relay in my transverter was an easy one to rewind. Two screws secure the cover, and the bobbin is easily removable. The 28 V coil held pretty fine wire—I measured the diameter, guessed the enamel thickness, and estimated the wire size as #42 AWG. From the table above, the new wire should be four wire sizes larger, or #38 AWG. I rewound the coil with #38, reassembled it and tested it. The relay now switches solidly at 11 V. A better choice might be #36 AWG wire, which would give a little more voltage margin for low-battery operation, but I don't have any in the junk box. Incidentally, this relay has an unusual construction that will not operate with the coil voltage reversed, so try it both ways to find the right polarity.

Alternative

As mentioned previously, we could have just removed turns to increase the current until the relay draws the same power at the lower voltage. If we remove half the turns, the resistance drops to half. The original resistance of the 48 V relay is $48 \text{ V} / 54 \text{ mA} = 888 \Omega$. At 12 V, we need 216 mA for the same power, or a new resistance of 55Ω , so we need one-sixteenth as many turns. We increased the current four times, so we end up with one-quarter as many ampere-turns as the original, or only one quarter as much

¹L. B. Stein, Jr, W1BIY, "Some Hints on Relay Operation," *QST*, Jun 1956, pp 21-25.

force pulling in the relay. If we weaken the spring enough, it may work, but will it be reliable?

A few more trials convinced me that no matter how many turns of the original wire are removed from a 48 V relay, the force pulling it in at 12 V will only be 25% of that at 48 V. A 28 V relay isn't as bad—the force is only reduced by 12/28, to a bit less than half the original force. There is probably a combination of turns and spring bending that will work, but if you've done enough disassembly to remove turns, why not take the rest off and rewind it for 12 V?

International

I haven't tried modifying any relays from other countries, but it wouldn't surprise me if they use other wire-sizing systems. In the UK, they may still use SWG sizes, which differ from AWG, but the relative sizes are close enough so that increasing the diameter by the number of sizes calculated above should work. So measure the wire, convert to the nearest AWG or SWG size, and go from there. I don't know what metric standard wire is available. (The Component Data chapter of the *ARRL Handbook*² contains a "Copper Wire Specifications" table that lists AWG specifications with the nearest equivalent SWG.—Ed.)

Conclusion

Rewinding a surplus coax relay for 12 V operation requires only one simple calculation and perhaps an hour of work; why not try it rather than pay exorbitant prices or use inefficient dc-dc voltage converters? —Paul Wade, N1BWT, 161 Center Rd, Shirley, MA 01464; e-mail n1bwt@qsl.net

PAINT SPRAY HEADS AS KNOBS

◊ I needed a replacement knob for the **TONE** rotary switch on my Heathkit HW-2036A 2 meter FM transceiver. My father keeps many old things in his large garage. Among them is a one-pound coffee can full of self-propellant spray-can controls (buttons). It took about 10 minutes to find one that would friction fit over the narrow diameter shaft of the switch. Key points of this replacement knob are:

- It is very close to being the same size as the original knob.
- It is knurled.
- The knob is black with the white nozzle section, which acts as a pointer.
- The knob end (spray can control top)

²The 1998 *ARRL Handbook* is Order No. 1743. ARRL publications are available from your local ARRL dealer or directly from ARRL. Mail orders to Pub Sales Dept, ARRL, 225 Main St, Newington, CT 06111-1494. You can call us toll-free at tel 888-277-5289; fax your order to 860-594-0303; or send e-mail to pubsales@arrl.org. Check out the full ARRL publications line on the World Wide Web at <http://www.arrl.org/catalog>.

has an arrow indented in it that points in the same direction as the white nozzle section.

- Total out of pocket cost is nil.

I have been using this "knob" since 1989.—*ARRL Technical Specialist Lawrence W. Joy, WN8P, 2116 E Mohawk Dr, Olathe, KS 66062-2432*

A GOOD SIDETONE OSCILLATOR

◊ I've generally found that a good sidetone oscillator is difficult to find. One common approach is to build an audio multivibrator—and that does produce an acceptable sidetone. Unfortunately, it produces a square wave, and my attempts to eliminate clicks have all produced an unacceptable chirp. Other approaches I've tried also have one or more undesirable characteristics: chirp, square-wave output or no shaping of the keyed waveform. This oscillator is different. It has shaped keying, no chirp and a sine-wave output.

The basic circuit is a phase-shift oscillator with an RC network supplying the necessary 180° phase shift between the collector and base. In order for the oscillator to work, it must have enough gain to more than overcome the losses in the phase-shift network. We can, therefore, manipulate the gain to start and stop oscillation. By shifting the gain just above and below the critical point, I can shape the envelope. Since this happens without keying any of the dc paths, there are no clicks.

R2 provides emitter degeneration and makes the circuit relatively device independent. With the key down, R3 is ac bypassed, the gain of the amplifier is predominantly determined by the ratio R1 / R2, and the oscillator will run. R2 is chosen such that the oscillator will not start "full on," but rather will ramp up nicely. Smaller values

of R2 produce harder keying. R2 also very helpfully provides a large base input resistance, so that the transistor does not load the feedback network.

With the key released, R1 / (R2 + R3) would determine the gain, if it were not for R4 and C1. Chose R1, R2 and R3 so that the amplifier gain is approximately 1 with the key up, and no oscillation is possible. However, R4 and C1 provide shaping of the envelope "tail." Simply adjust R4 a bit past the point where oscillation ceases with the key up, and it will be about right.

With the values shown, the circuit draws very little current, and delivers a sine-wave output with a nicely shaped envelope. With a 12 V supply, the output is about 5 V (P-P) and keying is good over the 12 to 13.5 V operating range.

There are a couple of minor bugs: The output impedance is about 10 kΩ, so the circuit requires a high-input-impedance buffer. Also, the circuit loses about three dots when you first switch it on. Since the oscillator draws so little power, I just leave it on always.—*Denton Bramwell, K7OWJ, 2853 E Country Oaks Dr, Layton, UT 84040; e-mail denton@cyber-west.com*

Hints and Kinks items have not been tested by QST or ARRL unless otherwise stated. Although we can't guarantee that a given hint will work for your situation, we make every effort to screen out harmful information. Send technical questions directly to the hint's author.

QST invites you to share your hints with fellow hams. Send them to "Attn: Hints and Kinks" at ARRL Headquarters (see page 10), or via e-mail to rschettgen@arrl.org. Please include your name, call sign, complete mailing address, daytime telephone number and e-mail address on all correspondence. Whether praising or criticizing an item, please send the author(s) a copy of your comments.

QST

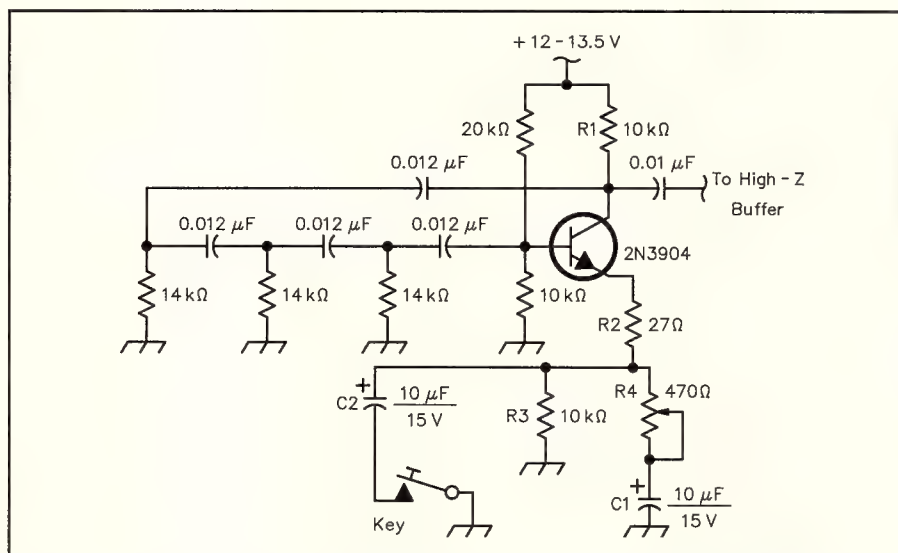


Figure 1—K7OWJ's sidetone oscillator. Use 1/4 Ω, 5% tolerance resistors, and ceramic disc capacitors except for C1 and C2, which are electrolytics. Equivalent parts may be substituted.

Technical Correspondence

Edited by Paul Pagel, N1FB • Associate Technical Editor

WHICH SOLAR ACTIVITY MEASUREMENT SHOULD I USE?

By R. Carl Luetzelshwab, K9LA, 1227 Pion Rd, Fort Wayne, IN 46845

◊ Saturday—My weekly DX bulletin just arrived in the early morning mail, and it says the HKØ operation is supposed to be on around 1600 UTC. Let's see...that's 11 AM here, so I'd better get in gear. I need HKØ on 12 meters for DXCC! So I'll listen to WWV to see what the numbers are. Then I can run a quick propagation prediction to see if I'll have a chance on 12 meters today... It's just coming around to 18 minutes past the hour...I'm in luck—I won't have to listen to WWV for long.

Okay, not bad. The K index is 2, and the solar flux is 169. Let's put that solar flux into my propagation prediction program and see what the MUF is around 1600 UTC. Well, shoot! It says the MUF is only 22.7 MHz. That's not enough for 12 meters! No use wasting my time today. Besides, I have things to do around the house.

Sunday—Well, yesterday wasn't too good. Maybe today will be better for the HKØ on 12 meters. Let me check Packet, too, to see what's happening. Whoa! What's this? One of the locals spotted the HKØ operation on 12 meters yesterday—and comments that they had a good signal! I bet he worked them, too! Darn! That ticks me off! My propagation prediction program screwed up! I'm going to call those guys tomorrow and tell them their program isn't very good, then I'll buy a better one.

Does this scenario sound familiar? What happened? Did the propagation program really screw up? Let's take a deeper look at this. We'll learn some interesting things along the way—ultimately we'll see why it's best to *not* use daily solar flux for propagation prediction programs.

To start with, the ionosphere varies quite a bit day-to-day. This is seen in Figure 1, which shows typical observed F region critical frequencies (foF2) for each day at the same hour during a one month period (the specific hour is 1600 UTC, and the month/year is December 1980). It indeed bounces around a bit every day (even at the same hour). If we throw out the data on the 20th and 21st because of some magnetic field storminess, it still says foF2 varied from a low of 6.2 MHz to a high of 8.9 MHz at the same hour each day of the month.

Remembering that the F region MUF is approximately three times the F region

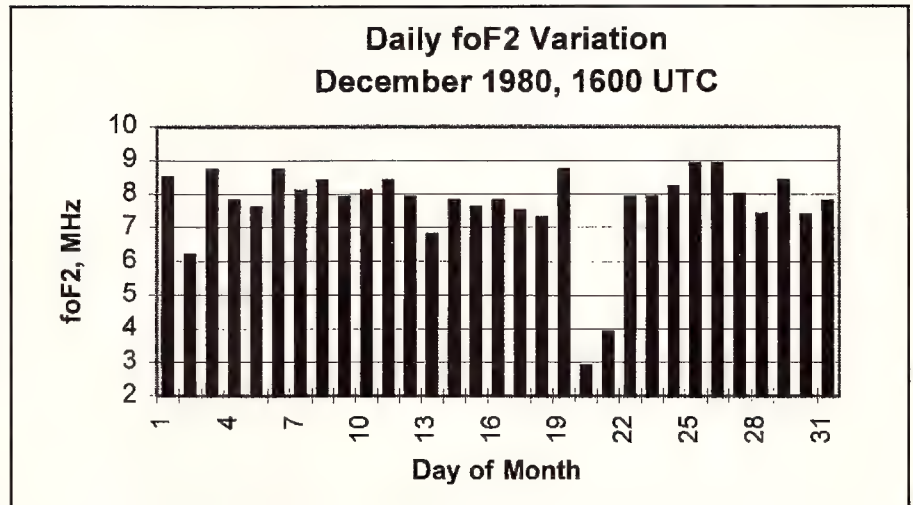


Figure 1—Daily foF2 variation.

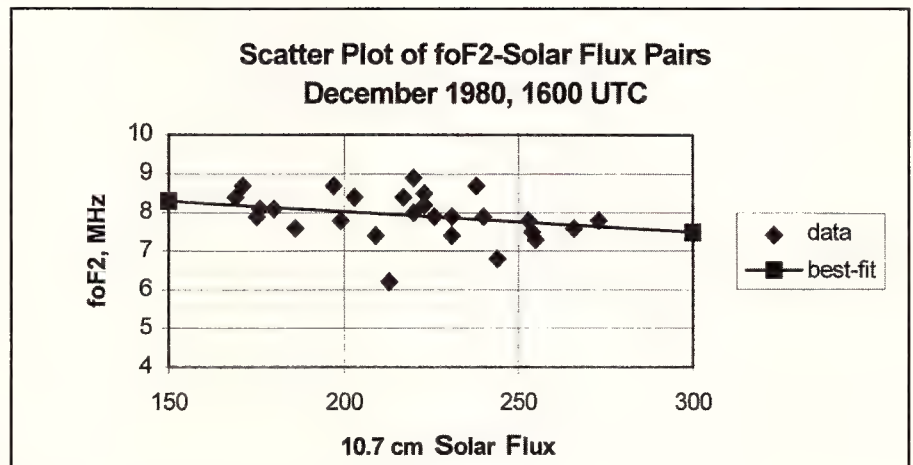


Figure 2—Scatter plot of foF2-solar flux pairs.

critical frequency (I used 3.15 for my calculations—this corresponds to an F region peak at about 300 km and an elevation angle of about 7°) says the observed F region MUF at 1600 UTC was anywhere from 19.5 MHz (the 17 meter band) to 28.0 MHz (the 10 meter band), depending on the day chosen. Yes, that's a lot of day-to-day variation. No problem, though. As long as the daily critical frequency correlates to the daily solar flux, we're okay.

Right off, an alarm bell should sound. Solar flux is measured *only once per day*, so trying to correlate it to a specific hour in the day may be a problem. But let's see what happens anyway.

Figure 2 is a scatter plot of each day's

data at 1600 UTC during December 1980 (with the 20th and 21st thrown out as discussed earlier). Each plotted point represents an foF2-solar flux pair at 1600 UTC. There's also a best-fit straight line drawn (compliments of the graphing software) to show what the correlation is, if any.

What the best-fit straight line indicates is that as solar flux increases, foF2 decreases. But that's a contradiction to what we know really happens. What's wrong here? It really says that there *isn't* a good correlation between daily foF2 and daily solar flux! The true underlying problem is that the solar flux at 10.7 cm is not the ionizing energy.

If that's true, how do propagation pre-

diction programs work? This daily variation was recognized early on, and resulted in looking for a much better correlation between some aspect of the critical frequency and some aspect of the solar flux. The answer was to use the *monthly median critical frequency* and the *smoothed* (12-month running average) solar flux.

To illustrate this concept, the median critical frequency of the observed data in Figure 1 is 7.9 MHz. Using the lowest solar flux observed in December 1980 (169 on the 8th of the month) in a propagation prediction program would give a predicted median MUF of 22.7 MHz—about 9% too low. This is what caused the specific problem in the scenario at the start of this discussion.

Using the highest solar flux observed in December 1980 (273 observed on the 16th) would give a predicted median MUF of 29.4 MHz—about 18% too high. That's not good, either—it would be overly optimistic in predicting an opening. Finally, using the smoothed solar flux for December 1980 (196) would give a predicted median MUF of 24.9 MHz that is equal to the observed median MUF. *That's what we want.*

So it wasn't the propagation prediction program's fault in the opening story—it was the use of the improper value of solar activity. Thus, for best accuracy in propagation predictions, use the smoothed solar flux (or smoothed sunspot number). That's how the model of the ionosphere was developed. Using the daily solar flux will significantly compromise the prediction accuracy.

CHRYSLER RESPONDS

By Bill Gilmore, WB8FPQ, EMC Tech Club, Product Engineer, Chassis/Drivetrain Electronics Group, Truck Platform Electrical/Electronics Engineering, Plymouth Road Office Center, Chrysler Corporation, CIMS 514-16-60, PO Box 33514, Detroit, MI 48227-3086

◊ In response to the reply to Art, N8BLK, in the "The Doctor is IN,"¹ we would like to offer the following explanation of our position. Chrysler is specific in its recommendation to connect the radio negative power lead to *body sheet metal* at the radio or to *body sheet metal* at the battery connection, *not* at the battery. This is a very important point that has been missed in the response.

If the negative connection is made at the body where the battery is bonded, it will not cause the effects described in the response. If the battery negative lead opens, the vehicle running load as supplied by the alternator is safely returned to the alternator negative at the engine block. If the vehicle is off, it cannot draw starter current through *any* path, ensuring a safe condition for all wiring and accessories.

As confirmation of this technique, note that all of the load devices in the entire vehicle, as supplied by the OEMs, (including brands F and G) are connected in this fashion.

It is a mystery to us why Japanese radio manufacturers insist on supplying wiring kits with the negative lead fused, unless it is to accommodate positive ground vehicles (certain classic British cars and some older brands of medium and heavy trucks and construction equipment). Even this is not possible where the dc and RF grounds in the radio are not isolated for dc.

The hazard that is described with the negative lead fused and connected at the battery, is if the negative fuse opens (one or the other will open first on an overload, or sometimes for no reason: a 50/50 chance), all of the radio current will seek an alternate path to battery negative. If the radio chassis is

¹The response to the question posed by Art Clemons, N8BLK, "The Doctor is IN," QST, Aug 1997, p 50.

securely connected to body sheet metal (hard to guarantee in today's vehicles, with high content of structural thermoplastics), this is probably not a problem. If the only connection is through the coax shield to the antenna base, a high power radio will probably cause some local heating at the highest resistance point, possibly at the antenna base.

Again, note that fusing only the positive supply is the standard practice of the manufacturers of commercial two-way transceivers, as well as other add-on accessories.

[Several automobile manufacturers, including Chrysler, have developed printed guidelines to assist those customers who want to install transceivers in their cars. It is important that each manufacturer's guidelines be followed carefully. This will help ensure that both the installed equipment and the automobile work as designed. Most manufacturers will only support customers who follow their guidelines exactly.—Ed Hare, W1RFI]

Letters for this column may be sent to Technical Correspondence, ARRL, 225 Main St, Newington, CT 06111, or via e-mail to ppagel@arrl.org. Please include your name, call sign, complete mailing address, daytime telephone number and e-mail address on all correspondence. Whether praising or criticizing a work, please send the author(s) a copy of your comments. The publishers of QST assume no responsibility for statements made herein by correspondents.

Feedback

◊ There was an error in the description of one of the photos that appeared on our November 1997 Field Day cover. Bob Melvin, WT10, is instructing Dakota Whitaker at the combined Barnstable ARC and Sandwich ARC site on the Cape Cod Canal, not at the Framingham ARA location. **QST**

New Products

THE CLEAR TONE COMMUNICATIONS SPEAKER FROM MFJ

◊ Designed to improve the intelligibility of SSB, FM, AM and CW signals in the 600 to 4000 Hz range, MFJ's Model 281 ClearTone Communications Speaker reduces noise, static and hum. The 3.75 x 3 x 2.25 inch unit features a high-grade, 3-inch Mylar cone speaker mounted in a special baffle and covered with a fine mesh grille. A swivel bracket lets users direct sound where it's needed. The 8-Ω speaker can handle up to 8 W of audio power.

Price: \$9.95. Backed by MFJ's "no matter what" unconditional one-year warranty,

the MFJ-281 is available from your local Amateur Radio dealer or by contacting MFJ, 300 Industrial Park Rd, Starkville, MS



39759; tel 800-647-1800; fax 601-323-6551; <http://www.mfjenterprises.com>.

POWER SUPPLY UPGRADE KIT FOR COLLINS 30L-1 AMPLIFIERS

◊ Designed to restore your 30L-1 amplifier to full output power (900 W key down), Steve Pautard, WN4I, is offering a power supply upgrade kit that requires only seven wires and a few screws. The updated circuit board features eight 1-kV, 3-A diodes and six 140 μF, 450-V computer-grade filter capacitors. The new circuit provides more current for modulation peaks and lets the power transformer run cooler.

Price: Ready to install, \$122 plus S&H; Installed by me, \$132 plus UPS shipping for your amplifier. For more information, contact Steve Pautard, WN4I, 5833 Dryden Rd, West Palm Beach, FL 33415; tel 561-689-8819. **QST**

FCC Opens Vanity Gate 4!

The FCC has announced that vanity call sign Gate 4—the last vanity gate—will open December 2, 1997, for General, Tech Plus, Technician and Novice class hams to request a vanity call sign.

Applicants may use either the electronic Forms 610V and 159 on the Web or hard-copy Form 610V and 159—but not both. Both versions—plus fact sheets and answers to frequently asked questions—are available at <http://www.fcc.gov/wtb/amateur>. The application fee is \$50, payable by check (to “FCC”), bank draft, money order or credit card. Do *not* send cash. The FCC gives processing priority to electronically filed Forms 610V for which the filing fee and Form 159 have been received.

It's up to applicants to make sure that their applications do not arrive before December 2, 1997. The FCC will return all applications that arrive early.

Any call sign requested must be appropriate for your license class. Technician, Tech Plus, and General class licensees may ask for a Group C (1×3) or D (2×3) call sign. Novice class licensees may request only Group D call signs.

Electronic filers must mail the Form 159 Fee Remittance Advice to: FCC, Amateur Vanity, PO Box 358994, Pittsburgh, PA 15251-5994. The Form 159 and the fee must be received within 10 days of electronically filing your Form 610V or your application will be dismissed.

Those filing on document forms must mail the application package containing a completed Form 610V with a copy of your license attached, Form 159, and the proper fee in a sealed envelope to: FCC, Amateur Vanity, PO Box 358924, Pittsburgh, PA 15251-5924.

Application packages via courier or delivered by hand must be prepared in the same way, sealed in a second, outer envelope, and addressed to: Federal Communications Commission, c/o Mellon Bank, 525 William Penn Way, 27th Floor, Room 153-2713, Pittsburgh, PA 15259, ATTN: Wholesale Lockbox Shift Supervisor.

For general information, call the FCC's toll-free National Call Center, 888-225-5322 (CALLFCC).

Amateur Radio Legend Doug DeMaw, W1FB, SK

Acclaimed ham radio icon Milton F. “Doug” DeMaw, W1FB, died September 28. He was 71. One of the most widely published technical writers in Amateur Radio, DeMaw was diagnosed with leukemia earlier this year and had been in failing health.

DeMaw was first licensed in 1950 as W8HHS. He later became W1CER. An electrical engineer, he was a member of the ARRL Headquarters staff for 18 years—from 1965 to 1983—and served as Technical Department Manager and Senior Technical Editor from 1970 to 1983. (His wife, Jean, W1CKK, also worked on the Headquarters staff.) During his tenure at HQ, DeMaw served as editor of *The ARRL Handbook*. In 1970, he engineered the shift in emphasis toward solid-state design in *QST* and the *Handbook*. He wrote hundreds of articles for *QST* and other publications. DeMaw also was founder and publisher of *VHFer Magazine*. DeMaw was a life member of the ARRL, a senior member of the IEEE, and a member of the QRP Hall of Fame.

After retiring to the family farm in Luther, Michigan, he was elected chairman of the Lake County Board of Commissioners and continued to write books and articles. He also tried his hand in the Amateur Radio business as proprietor of Oak Hills Research. Among his other books, DeMaw wrote *W1FB's Design Notebook*, *W1FB's QRP Notebook*, *W1FB's Antenna Notebook*, and *The ARRL Electronics Data Book*, which remain popular. In recent years, DeMaw also penned regular columns for *CQ* magazine and *Monitoring Times*.

At its October 11 meeting, the ARRL Executive Committee recommended to the Board of Directors that the Technical Excellence Award be renamed the Doug DeMaw Technical Excellence Award, as requested by several members who have earned this award.

A former ARRL colleague, Membership Services Manager Chuck Hutchinson, K8CH, counted DeMaw among his friends. “Doug loved to experiment with circuits and antennas. He also loved to encourage others to try their hand at building,” he recalled. Hutchinson said DeMaw not only wrote prolifically about ham radio but also about gardening, another of his avocations. “He was an avid gardener and cook,” he said. DeMaw also was an outdoorsman and hunter. “He loved to hunt with bow and rifle—both modern and muzzle loader. He was very good at throwing a knife or hatchet,” Hutchinson said.

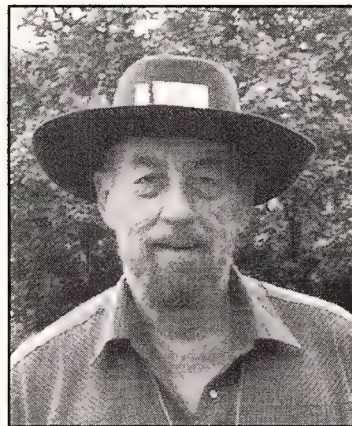
HQ staff member Paul Pagel, N1FB, also was one DeMaw's colleagues during his days at ARRL HQ. “Amateur Radio benefited greatly from his work,” Pagel said. “He was a multifaceted man. I doubt there was anything he couldn't do if he set his mind to it.” Retired HQ staffer Jerry Hall, K1TD, who also worked with DeMaw during his years at the League, called DeMaw a writer of “uncanny” ability. “Doug could write it once, and it was done,” he recalled.

Another former HQ staffer, Gerry Hull, W1VE/VE1RM, called DeMaw an important career influence. “He was always there when I was stuck with a tough technical challenge,” he said.

Jim Jones, K5GSH, of Albuquerque, New Mexico, called DeMaw's death “a personal loss.” Jones recalled how, as a young ham, he had problems getting one of his first transmitters to work. He called the ARRL and DeMaw talked him through the circuit and helped him to uncover the problem. “I remember thanking Mr. DeMaw. He plainly told me that hams are friendly folk and always share what they know.”

Forrest Plumstead, WB5HQO, of Ft Richardson, Arkansas, expressed similar sentiments. “He, more than anyone else I can think of, encouraged me to build my own equipment,” he said. “The world of ham radio has lost one of its giants.”

In addition to his wife, survivors include their son, David, N8HLE, a technical writer who lives in Connecticut. Memorial contributions may be made to Luther Historical Museum, c/o Luther State Bank, Box 39, Luther, MI 49656.



CHUCK HUTCHINSON, K8CH

FCC Issues New Form 610—Old Versions Obsolete

The FCC has announced that as of January 1, 1998, Amateur Radio applicants may only submit FCC Forms 610, 610A and 610B that carry an edition date of September 1997. After the first of the new year, previous editions of Form 610 will not be accepted for filing by the FCC or by Volunteer Examiner Coordinators (VECs). Amateurs may begin using the new Forms 610 now.

The major change on the new form is a certification that says the applicant has "read and will comply with Section 97.13(c) of the Commission's Rules" regarding RF radiation safety and the amateur service section of OET Bulletin No 65, *Evaluating Compliance with FCC-Specified Guidelines for Human Exposure to Radio Frequency Electromagnetic Fields*. At the time the FCC announced the new form, Amateur Radio Supplement B of Bulletin 65 was still in the draft stages and not yet available to the ham radio community.

ARRL Executive Vice President David Sumner, K1ZZ, said the League was troubled that the new Form 610 could be in the hands of hams before the Amateur Radio supplement became available. "We are very

concerned that a deadline has been set for amateurs to comply with before the information they will need in order to comply has been made available to them," he said.

ARRL Lab Supervisor Ed Hare, W1RFI, who's been involved in reviewing the draft supplement, said he expected the FCC to release it in November. The ARRL will release a book on the new RF safety regulations in the coming months. "Above all, it is important that the required station evaluation be as easy as possible for hams," Hare said. "The FCC has pretty much met that goal—most hams, by virtue of their power levels, will not need to do an evaluation at all."

Section 97.13(c) says that before you transmit "from any place where the operation of the station could cause human exposure to RF electromagnetic field levels in excess of those allowed," you have to perform a routine RF environmental evaluation if your power input to the antenna exceeds these limits: 160-40 meters, 500 W; 30 meters, 425 W (legal limit is 200 W—Ed); 20 meters, 225 W; 17 meters, 125 W; 15 meters, 100 W; 12 meters, 75 W; 10 meters, 50 W; 6, 2, and 1 1/4 meters, 50 W; 70 cm, 70

W; 33 cm 150 W; 23 cm, 200 W; 13 cm, 250 W; SHF/EHF (all bands) 250 W. (The FCC also has set 500 W ERP as the power level below which an RF safety evaluation will not be required for most amateur repeater stations.) If the routine environmental evaluation indicates that the RF electromagnetic fields could exceed the maximum permissible exposure limits, you must take action to prevent human exposure.

You can get the new Forms 610 from the FCC's Web site at <http://www.fcc.gov/formpage.html>, at <ftp://ftp.fcc.gov/pub/Forms/> or by fax at 202-418-0177 (request index, or for Form 610 use form code 000610, for Form 610A use form code 006101, for Form 610B use form code 006102). The FCC Forms Distribution Center accepts orders at 800-418-3676. ARRL VEs and VE teams were expected to have a supply of the new Forms 610 by late November.

Individual hams may get a copy of the new Form 610 by sending a self-addressed, stamped envelope (SASE) to ARRL/VEC, 225 Main St, Newington CT 06111. Include 32 cents postage for each Form 610 requested.

WRC-97 Under Way in Geneva

Ham radio is well represented at the International Telecommunications Union's 1997 World Radiocommunication Conference, which began October 27 in Geneva, Switzerland. WRC-97 is set to wrap up on November 21. ARRL Technical Relations Manager Paul Rinaldo, W4RI, is a member of the US delegation. Others attending include IARU representatives Larry Price, W4RA, Wojciech Nietyksza, SP5FM, and Michael Owen, VK3KI. Jim Dean, VE3IQ, of Radio Amateurs of Canada, and David Wardlaw, VK3ADW, of the Wireless Institute of Australia are on their nations' delegations.

Among many other topics, the so-called "Little LEO" issue will come before the WRC-97 delegates. Current US proposals do not include any plans to share amateur frequencies, but this does not prevent other

countries' delegations from bringing up plans that might adversely affect ham radio allocations. An FCC order to confirm an industry agreement to share existing Little LEO allocations warned the industry not to expect additional spectrum in the future. "We had significant difficulty obtaining spectrum for Little LEO service at WRC-95," the FCC said. However, Little LEO advocates continue their attempts to justify additional allocations.

WRC-97 delegates will set the agenda for WRC-99, which is expected to include two important ham radio topics. One is discussion of a possible exclusive worldwide 40-meter allocation at 6900 to 7200 kHz. Only 7000 to 7100 kHz now are available in Regions 1 and 3, where broadcasters dominate the upper 200 kHz of the band. Another is Article S25 of the international radio regu-



lations. Article S25 covers all aspects of the Amateur Service including the Morse code requirement for operation below 30 MHz.

WRC-97 delegates also will be asked to add the Earth Exploration Satellite service to the 430 to 440 MHz band and to upgrade the status of EES in the 1240 to 1300 MHz band. The issue of wind profiler radar systems—operating at 50, 449 and 1000 MHz and having some potential for interference to Amateur Radio allocations—also is among the WRC-97 topics.

FCC ANNOUNCES ON-LINE RENEWAL FORM 900

The FCC has consolidated eight renewal forms into one on-line form. Called Form 900, Application for Electronic Renewal of Wireless Radio Services Authorizations, this form is an interim measure to permit all FCC Wireless Telecommunications Bureau licensees, including hams, to renew their licenses via the Internet.

This form is *only for renewals*, not for license modifications. You can only enter changes (eg, name, address) using Form 900 as a part of the process of renewing your license. You can only access Form 900 if the expiration date on your license falls

within the renewal window (within 120 days of expiration). You *cannot* use Form 900 to renew an expired license. Form 900 may only be submitted electronically.

Access Form 900 on the WTB Electronic Commerce page, <http://www.fcc.gov/wtb/electcom.html> (click on Production Page for Electronic Commerce Applications to access the Form 900). Once you've entered your call sign and accessed the form, click on any item number for filing instructions. After filing the form, click on Electronic Renewal Query. This lets you view or print the information submitted.

Click on the Continue button to obtain the fee information pertaining to your fil-

ing. The screen will prompt you with a Fee Remittance Advice, Form 159. The form will indicate that there is no charge to renew an Amateur Radio license (except for vanity call sign holders, who won't have to renew for several more years yet).

Send comments about the FCC Form 900 to sreed@fcc.gov. For technical assistance, call the FCC Technical Support Group at 202-414-1250.—FCC

FLORIDA JUDGE THROWS OUT SCANNER CASE AGAINST HAM

A judge in Florida has dismissed a case against Joseph Osborn, KF4HXE, of Plantation, Florida, whose radio gear was con-

fiscated by police under Florida's "scanner" law earlier this year. Osborn was involved in a minor accident last May and subsequently cited by police in Davie, Florida, allegedly for breaking state law by having radios in his car capable of receiving police frequencies. Although the law specifically exempts hams, Davie police impounded Osborn's equipment anyway because he could not produce his ham ticket—lost during a recent move. Even after Osborn showed Davie police a copy of his license, authorities refused to drop the charges or to return his radios. Osborn later learned that police might have tampered with his equipment, possibly damaging it and voiding warranties.

Alexander L. Kaplan, KF4QBU, of Boca Raton—an ARRL Volunteer Counsel—represented Osborn. John Hennessee, N1KB, of the ARRL Regulatory Information Branch, supplied information on federal preemption.

Broward County Court Judge J. Steven Shutter dismissed the case dismissed in August. Shutter said the state law does not require hams to have their licenses in their possession, as local police had asserted. He also cited federal pre-emption of prosecution of hams under state and local laws that make it illegal to possess scanning radios capable of receiving public safety or emergency frequencies. Florida's law bans such scanners in vehicles and in retail stores, but not in homes.

Shutter ordered Davie police to return Osborn's radio equipment and to provide an affidavit specifying "who, what, when, where and how the radios were examined and what was done to them." Osborn has since recovered his radios.

ARRL SEEKS CHANGES TO CW WAIVER RULES

The ARRL has asked the FCC to change the way Morse code exam exemptions for severely handicapped applicants are handled. The League wants to change the procedural requirements in Part 97 that must be met, prior to granting examination credit.

Under the League's proposed changes, a candidate at least would have to *attempt* the CW test—with any and all necessary accommodations—before being granted an exam waiver based on a physician's certification. Also, Volunteer Examiner Coordinators (VECs) would be entitled to request medical information pertinent to an applicant's handicap from the certifying physician. VECs also would be required to have this information on file before the application is forwarded to the FCC for processing.

In its petition filed September 23, the League said the two "rather minor changes" are needed to restrict the waiver process to use by severely handicapped individuals "for whom the process was intended in the first place and who deserve the substantive accommodation." The League also said the changes would "stem abuses" of the waiver system without putting unreasonable burdens on examinees.

FCC SEQUENTIAL CALL SIGN UPDATE

The following is a list of FCC sequentially assigned call signs issued as of October 1, 1997.

District	Group A Extra	Group B Advanced	Group C Tech/Gen	Group D Novice
0	AB0GH	KI0KE	++	KC0CAA
1	AA1SS	KE1IP	N1ZSQ	KB1CFD
2	AB2EH	KG2MP	++	KC2CLQ
3	AA3QI	KF3AJ	N3ZXI	KB3BVI
4	AF4FS	KU4LB	++	KF4UEF
5	AC5NX	KM5MG	++	KD5CIQ
6	AD6DF	KQ6RZ	++	KF6NMB
7	AB7WM	KK7KB	++	KC7ZHD
8	AB8BG	KI8DU	++	KC8IOH
9	AA9UY	KG9LK	++	KB9RLN
N Mariana Island	NH0B	AH0AY	KH0GT	WH0ABI
Guam	++	AH2DE	KH2SL	WH2ANV
Hawaii	AH7V	AH6PD	KH7GU	WH6DEI
American Samoa	AH8P	AH8AH	KH8DK	WH8ABF
Alaska	AL0F	AL7QU	KL0KK	WL7CUM
Virgin Islands	++	KP2CM	NP2JT	WP2AIJ
Puerto Rico	NP3O	KP3BC	NP3RE	WP4NMM

++All call signs in this group have been issued in this district.

The CW waiver system has been in effect for seven years. The League says that experience has shown that many applicants without severe handicaps "have abused the process" by obtaining physicians' certifications of inability to pass the telegraphy examination. At present, 8% of those applying through the ARRL-VEC have requested a medical exemption from the higher-speed code requirement. Another large VEC reports similar experience.

FCC rules requires volunteer examiners

to exercise broad latitude in administering CW exams to accommodate handicapped applicants. Instead, the League observed in its filing, there is "a tendency for applicants to seek exemptions instead" of accommodations.

As of press time, this petition had not been given a rulemaking (RM) number.

FCC ADMINISTRATIVE LAW JUDGE REAFFIRMS KV4FZ DECISION

An FCC administrative law judge has reaffirmed his decision to not renew the operator and station licenses of Herbert L. Schoenbohm, KV4FZ, of Kingshill, Virgin Islands, but the saga continues. Early last year, FCC Administrative Law Judge Edward Luton determined the Commission should not renew Schoenbohm's ham ticket, but Schoenbohm filed exceptions. The FCC remanded the case to Luton. His supplemental initial decision September 30 contained additional findings of fact and reaffirmed his earlier decision.

Schoenbohm's attorney said he planned to file exceptions to the judge's most recent decision. If that is unsuccessful, he still has a judicial appeal (US Circuit Court of Appeals, District of Columbia) available to him. In the meantime, Schoenbohm may continue to operate.

In late 1992, Schoenbohm, now 57, was found guilty in US District Court of using a "counterfeit access device" to make long-distance telephone calls. While his initial conviction did not specifically involve breaking FCC regulations, Schoenbohm eventually ran directly afoul of the Commission, which said his conviction "is relevant to evaluating the likelihood that he will comply" with the FCC's Amateur Radio rules.

In early 1994, the FCC designated his application to renew his ham radio license for a hearing, but extended the expiration date of the license until the matter could be settled.

Luton concluded after the hearing that

ROBERT M. MORRIS, W2LV, SK

Inventor, researcher and radio pioneer Bob Morris, W2LV, of Sparta, New Jersey, died October 15. He was 95. Morris was first licensed in 1922 as 2CQZ. He became 2LV (later W2LV) in the late 1920s. Early in his amateur career, Morris' 2CQZ (running a spark gap transmitter) was among the stations heard in Great Britain and in Europe during the ARRL's Third Transatlantic Tests (see *QST*, Feb 1923). He later worked with Edwin H. Armstrong, the man credited with inventing FM.

A noted broadcasting historian and storyteller, Morris appeared in Ken Burns' PBS documentary *Empire of the Air—the Men who Made Radio*. He was a member of the ARRL for 75 years, a founding member of the Antique Wireless Association and of the New Jersey DX Association, and a member of the Sussex County Amateur Radio Club.

Survivors include his wife, Dorothy, a son and daughter, and several grandchildren and great-grandchildren. The family has asked that donations in Bob Morris' memory be made to the Antique Wireless Association, c/o Dexter Deeley, Treasurer, 8 Briar Cir, Rochester, NY 14618.—thanks to Deb McKay, N2TTP

Schoenbohm's 1992 felony conviction plus his subsequent "knowing violation" of the FCC's *ex parte* rules "provides further evidence that the Commission will not be able to rely on him to be truthful or to comply" with FCC rules and policies. Schoenbohm was accused of improperly encouraging other people to intervene on his behalf with the FCC and of using ham radio to do so in at least one instance. The *ex parte* rules prohibit anyone in Schoenbohm's situation from directly soliciting such political intervention without FCC knowledge.

FCC documents show that KV4FZ had a distinguished record of Amateur Radio public-service and had helped provide emergency communication in several hurricanes. However, in reaffirming his earlier decision to deny Schoenbohm's license renewal, Luton concluded that Schoenbohm "made misrepresentations or lacked candor in his testimony about his felony conviction and *ex parte* communications."—FCC

HAM RADIO NOW AN "OFFICIAL" ISS PAYLOAD

Amateur Radio is now considered to be an official payload on the International Space Station (ISS). In fact, reports Matt Bordelon, KC5BTL, at Johnson Space Center, ham radio was the *first* payload to become official. Bordelon already has started the training program for the first crew who will be putting together the ISS starting in January 1999.

The SAREX Working Group and the ARISS International team have met with members of the International Space Station Program Office to ensure that ham radio has a place aboard the ISS.

Bordelon says the ISS Payloads Office lists Amateur Radio as being onboard the ISS in three phases. The first calls for delivery of a transportable Amateur Radio station (probably hand-held transceivers). With the first crew scheduled to arrive in January 1999 for a five-month stay, this will allow the crew to establish voice and packet contact with friends, family, school groups and other earthbound hams. It will operate from within the Russian service module, which is to serve as the primary crew residence during the early assembly period.

The next phase will include a ham radio site on the so-called Express pallets, possibly for a repeater or microsat-type system. The pallets—due to arrive on the ISS in January 2002—will have power, thermal, and telemetry connections plus good Earth visibility.

The final phase is a permanent station on the US Habitation Module, set for delivery sometime in 2002. It will have good Earth visibility and plenty of feedthroughs for external antennas. During the ISS international partners meeting in Houston in late 1996, the team agreed that this station should include slow and fast-scan TV, packet, voice, and experimental modes. It will include several frequency bands and modes (SSB and FM) and be able to interconnect with the ISS audio and video subsystems.

"This is truly a monumental decision

which will solidify the future of Amateur Radio on manned space vehicles," said AMSAT-NA Vice President for Manned Space Programs, Frank Bauer, KA3HDO. Joerg Hahn, DL3LUM, of the German SAFEX team also welcomed the news as "a good sign to know that the ham activities will be an official part of ISS." The ARISS team includes members from Great Britain, Germany, Italy, France, Japan, Russia, Canada and the US.

For more information on the International Space Station and the planned assembly sequence, see <http://station.nasa.gov/station/assembly>.—AMSAT News Service/
Frank Bauer, KA3HDO

KC5VPF ON THE AIR FROM MIR

By mid-October, US astronaut Dave Wolf, KC5VPF, had settled in aboard the Russian *Mir* space station to the point that he finally got a chance to get his feet wet on ham radio on Columbus Day. Tom Crowley, KT4XN, in Atlanta, Georgia, reports he responded to Wolf's CQ as the

spacecraft passed over Southern Florida. "We talked for about 5 or 6 minutes on 145.985 MHz," Crowley said.

The contact between Wolf and Crowley was the first reported *Mir*-to-Earth FM voice contact since Wolf, a relatively new ham with little on-the-air experience, joined the *Mir* crew in September. On October 5, Wolf felt confident enough to post what was probably his first packet message on the RØMIR system to Francisco Costa, CT1EAT. The message said, "New at ham, but will give it a try. Dave." KC5VPF also has been monitored over Europe calling CQ on 2-meter FM.

NASA has announced that US astronaut Andrew "Andy" Thomas, KD5CHF, will be the final US crew member aboard *Mir*. Thomas will launch aboard the shuttle *Endeavour* in January 1998 for a four-month stay. His scheduled departure in May will conclude more than two years of continuous American presence on *Mir*, which began in March 1996 with the arrival of astronaut Shannon Lucid.

In Brief

• **ARRL Audio News debuts:** The League inaugurated *ARRL Audio News*, a weekly, Web-based audio news service, on October 17. Compiled from *The ARRL Letter*, *ARRL Audio News* includes the week's top news from the world of Amateur Radio and the League. *ARRL Audio News* is available in *RealAudio* format via the ARRLWeb, <http://www.arrl.org/>. Tucson Amateur Packet Radio—TAPR—has generously agreed to provide space on its Web server to permit the League to offer this service. Senior Assistant Technical Editor Rick Lindquist, N1RL, who compiles and edits *The ARRL Letter* is the regular on-air voice for *ARRL Audio News*. The service is available free to anyone and may be retransmitted in whole or in part on VHF/UHF for bulletin purposes provided *ARRL Audio News* is credited as the source. Each edition of *ARRL Audio News* will contain up to 10 minutes of timely Amateur Radio news. It is available via the ARRLWeb every Friday by 9 PM Eastern Time. Dial-up telephone access to *ARRL Audio News* will be announced later. For more information, contact Rick Lindquist, N1RL, e-mail n1rl@arrl.org; tel 860-594-0222.

• **ARRL debuts 160-meter book:** The ARRL has introduced *DXing on the Edge—the Thrill of 160 Meters*, by Jeff Briggs, K1ZM. *DXing on the Edge* gives an insider's view at what it takes to make it on 160 meters and includes lots of interesting Topband history plus an audio CD of some exotic and exciting QSOs made from prominent DX stations. It's \$29.95 (plus shipping). Order Item No 6354. Call toll-free 888-277-5289 or see <http://www.arrl.org/catalog/6354/>.

• **QST Cover Plaque winners:** Robert W. Schmieder, KK6EK, won the September 1997 *QST* Cover Plaque for his article, "The 1997 VKØIR Heard Island Expedition." Michael Nie, KB8VMX, won the October *QST* Cover Plaque for his article "The Ohio River Flood of '97." Congratulations, Bob and Michael!

• **AMSAT board election results:** The results are in for the annual AMSAT Board of Directors balloting. A total of 1386 members voted in this year's election. Elected to two-year terms were Bill Tynan, W3XO (1234 votes); Stan Wood, WA4NFY (1161 votes); Dick Daniels, W4PUJ (1114 votes); and Joe Holman, AD7D (933 votes). Barry Baines, WD4ASW (842 votes), will serve as the alternate until the next AMSAT Board election. Tynan was also re-elected president of AMSAT-NA when the Board of Directors met in Toronto in October—AMSAT News Service

• **Azden, not Alinco:** To alleviate some confusion in the Amateur Radio community, the company that recently pulled out of the US ham radio market was Azden, based in New York, not Alinco, which is on the West Coast. Alinco reminds hams that it's still very much in business.

• **Ham radio at the CMA Awards:** Country music star Patty Loveless, KD4WUJ, did not repeat as female vocalist of the year at the 31st Country Music Association awards. Loveless had won the award two years running. Country legend Ronnie Milsap, WB4KCG, announced the nominees and this year's winner, Trisha Yearwood. During the awards telecast September 24, Loveless performed her latest, "You Don't Seem to Miss Me," with help from another legend, George Jones.

QST

MINUTES OF THE EXECUTIVE COMMITTEE

NUMBER 454

PHILADELPHIA — OCTOBER 11, 1997

Agenda

1. Approval of minutes of July 17, 1997, Executive Committee meeting
2. FCC matters
3. Legislative matters
4. Antenna/RFI matters
5. Other legal matters
6. International matters
7. Organizational matters
8. Recognition of new Life Members
9. Affiliation of clubs
10. Approval of conventions
11. Date and place of next meeting
12. Other business

Pursuant to due notice, the Executive Committee of the American Radio Relay League, Inc., met at 8:30 AM Saturday, October 11, 1997, at the Airport Marriott Hotel, Philadelphia, Pennsylvania. Present were President Rodney Stafford, KB6ZV, in the Chair; First Vice President Stephen A. Mendelsohn, W2ML; Executive Vice President David Sumner, K1ZZ; and Directors Mary Lou Brown, NM7N, Frank Butler, W4RH, Kay Craigie, WT3P, and Fried Heyn, WA6WZO. Also present were International Affairs Vice President Larry E. Price, W4RA, Directors Frank Fallon, N2FF, Tom Frenaye, K1K1, John C. Kanode, N4MM, and Edmond A. Metzger, W9PRN, General Counsel Christopher D. Imlay, W3KD, and Legislative and Public Affairs Manager Steve Mansfield, N1MZA.

1. On motion of Mr. Mendelsohn, the minutes of the July 17, 1997, Executive Committee meeting were approved in the form in which they had been distributed.

2. FCC matters were considered as follows:

2.1. Mr. Imlay reviewed the status of RM-9096, the petition by ITS America for access to 5850-5925 MHz for Dedicated Short Range Communication (DSRC) systems as part of the Intelligent Transportation System architecture in the United States. One commenter, 3M, has taken the position (which is contrary to the position of ITS America) that amateurs, along with Part 15 and Part 18 devices, should be excluded from the band. The ARRL will continue to oppose this, and to support the elevation of the Amateur Service to primary status at 5650-5725 and 5825-5850 MHz.

2.2. On September 16 the FCC issued a Memorandum Opinion and Order in PR Docket 93-61, regarding Automatic Vehicle Monitoring and Location Monitoring Services (AVM/LMS) in the 902-928 MHz band. The ARRL had filed a petition for reconsideration in this proceeding to defend continued amateur use of the band at power levels above those permitted to nonlicensed Part 15 devices. The FCC continues to maintain that amateur operation above those levels will subject amateurs to LMS operators' claims of harmful interference. On motion of Mr. Heyn, the General Counsel was instructed to seek an FCC declaratory ruling to establish that the burden of proof is on AVM/LMS systems in the event of a claim of harmful interference from the Amateur Service.

2.3. Since the July Board Meeting there has been no perceptible activity at the FCC on the petition of Checkpoint Systems, Inc., seeking relief from Part 15 restrictions for their antiquated anti-pilferage technology. The ARRL filed comments in opposition on the grounds that increased HF interference would result.

2.4. Numerous comments, most of them

supportive, were filed on the ARRL petition, RM-9150, which seeks to improve the FCC's handling of private-sector complaints of serious amateur rules violations.

2.5. Sierra Digital Communications, Inc., has filed a request for temporary waiver and petition for rule making seeking increased power for their product, an unlicensed point-to-point data communications link operating under Part 15 rules at 24 GHz. On motion of Mrs. Craigie, the General Counsel was instructed to file in opposition to both the waiver request and the petition for rule making.

2.6. The ARRL petition to allow greater flexibility in RACES communications, RM-9115, drew no opposing comments. The timetable for the possible release by the FCC of a Notice of Proposed Rule Making incorporating this proposal is unknown.

2.7. The Amateur Supplement to OET Bulletin 65, which is to explain how amateurs are to comply with the new RF exposure regulations, reportedly is still in rough draft form although its release has been promised for November. The ARRL is participating in the review of the draft through the RF Safety Committee and Laboratory Supervisor Ed Hare, W1RFL. The ARRL continues to pursue FCC preemption of local and state attempts to regulate in this field.

2.8. The comment period has closed on the FCC Notice of Proposed Rule Making to change the rules governing amateur spread spectrum operation, WT Docket 97-12, but the timetable for possible FCC action is unknown. Without taking formal action, the committee discussed whether the use of spread spectrum techniques might permit amateurs to make greater use of the 219-220 MHz band without interfering with the primary occupant, the Automated Maritime Telecommunications System (AMTS). This subject will be revisited at the next meeting.

2.9. An ARRL petition, RM-8763, seeks enhancement of the PRB-1 limited federal preemption of state and local regulation of Amateur Radio antennas. The FCC appears to have made no progress with regard to this petition. On motion of Mr. Mendelsohn, it was voted that the League continue to urge adoption of the antenna regulatory preemption policies contained in its petition, RM-8763, and that it submit comments in MM Docket 97-182 supporting a comprehensive antenna facilities siting policy, including amateur antenna structures.

2.10. The ARRL petition to expand 40-meter privileges in American Samoa, RM-9106, has not been acted upon.

2.11. FCC staff has noted that some call sign blocks are reserved for locations where, because the locations cannot be reached via the Postal Service and therefore have no mailing addresses, no call signs can be assigned under present FCC procedures. Mr. Sumner reported that demand for 1x1 special event call signs is low, with just 54 call signs having been coordinated during the first six weeks of the program (35 of them through the ARRL). There is some demand for special event call signs outside of the 1x1 block. On motion of Mr. Heyn, staff was requested to study a possible expansion of the existing special event call sign program and to report prior to the next meeting of the committee.

2.12. Mr. Imlay reported that the FCC is permitting AMTS licensees to offer service on a secondary basis to land mobile stations (PR Docket 92-257). This may tend to reduce the willingness of AMTS licensees to coordinate amateur operations at 219-220 MHz.

2.13. The ARRL petition to modify FCC procedural requirements for medical exemptions from Morse code examinations was filed on September

23, and has not yet been given an RM-number.

2.14. Mr. Imlay distributed a draft petition responding to the Board's instruction at Minute 63 of the 1997 Second Meeting. The draft requests that the FCC add the following sentence to Section 97.101(a) of the Rules: "Amateur operators should be familiar with, and should abide by, the voluntary band plans that are applicable to the frequency bands in which they operate." During the course of discussion, Mr. Heyn indicated his strong desire to file the petition as soon as possible. However, other committee members expressed the view that the full Board should take into consideration information developed in the course of preparing the petition before the petition goes forward. Work on the item is continuing.

2.15. At the request of Mr. Kanode, the committee considered possible changes in the rules governing the operation of repeaters during out-of-band conversations. No action was taken.

2.16. Mr. Imlay reported that an FCC Daily Digest item had implied that the appeal of Herbert Schoenbohm, KV4FZ, of the FCC decision to not renew his amateur license had been dealt with administratively, and denied. In fact, Mr. Schoenbohm's administrative appeals have not yet been exhausted.

2.17. In response to a question, Mr. Imlay reported that there has been no further FCC action on the waiver request of EDAP Technom for authority to operate an ISM device on 1296 MHz at power levels far beyond what is permitted at that frequency. The ARRL continues to vigorously oppose the waiver request.

3. Mr. Mansfield reported on legislative and public relations matters as follows:

3.1. The ground rules for organizational participation in The Alliance for Youth, the program that grew out of the President's Summit for America's Future earlier in the year, have changed somewhat since the program was first announced. The ARRL has applied to participate through a "Radio Coaches" program, using Amateur Radio volunteers to introduce young people to careers in technology as well as to Amateur Radio. We are now waiting to see whether our application is acceptable under the new rules, or whether it will require modification.

3.2. Legislation is moving very slowly in Congress, with budget, appropriations, and authorization bills occupying much of the Congressional calendar. Amateur Radio spectrum protection legislation has not yet been introduced.

3.3. H.R. 2369, a bill "to strengthen and clarify prohibitions on electronic eavesdropping, and for other purposes," has caused great concern among ARRL members. A "Dear Colleague" letter dated September 30 from Telecommunications Subcommittee Chairman Billy Tauzin, R-LA, necessitated the distribution of an ARRL White Paper explaining why we believe the legislation should not be supported in its present form.

3.4. H.R. 2383, introduced in the House on September 3 by Representatives Ehlers (R-MI) and Coble (R-NC), attempts to permit the local enforcement of CB rules violations but falls short of the safeguards for licensed services, including the Amateur Radio Service, that are contained in similar legislation, S. 608, introduced earlier in the Senate by Senator Feingold (D-WI).

3.5. Hearings have been held on the four nominees for the FCC, but the Senate vote on the nominations has not yet been scheduled.

The committee was in recess for luncheon from 12:07 to 1:17 PM.

4. Mr. Imlay reported on local antenna/RFI regulatory matters as follows:

4.1. In *Korins v. Kornienko*, a New Jersey case, the ARRL has submitted a carefully re-

sought *amicus curiae* brief reciting the law on preemption of radio frequency interference. Mr. Fallon noted the efforts of the Amateur Radio community to raise funds in support of Mr. Kornienko's defense.

4.2. A new ordinance in Milwaukee, Wisconsin, apparently aimed at broadcast and commercial antenna installations, does not adequately exempt radio amateurs. The local amateur community is seeking appropriate amendments.

4.3. In *State of Florida v. Joseph Osborn*, a trial court has dismissed criminal claims brought against a radio amateur for possession of a transceiver capable of receiving police communications and has ordered the equipment returned to him. The case was handled successfully by an ARRL Volunteer Counsel.

4.4. The status of FCC enforcement actions in the Amateur Radio Service was discussed briefly. The General Counsel was asked to include the status of pending cases in his regular reports to the committee.

5. With regard to other legal matters:

5.1. The committee was in executive session briefly to review personnel matters and the status of litigation to which the ARRL is a party.

5.2. Mr. Imlay reported that trademark applications have been filed for "VUCC" and "Repeater Directory." He will supply a list of all trademarks registered by the ARRL.

6. The following international matters were discussed:

6.1. Mr. Stafford entertained questions on the IARU Region 3 Conference in Beijing. Some Directors reported being asked by members why it was necessary for the ARRL to send five representatives to this conference, since there are relatively few full members of the ARRL who reside in Region 3. Mr. Stafford and others noted that the conference provided a unique opportunity to meet with the leaders of Amateur Radio from the countries of the Asia-Pacific area by traveling to a single location, and to renew or establish personal relationships that may be important in achieving Amateur Radio's international goals. Mr. Price called attention to Mr. Sumner's role as recording secretary of the conference working group dealing with World Radiocommunication Conferences and other ITU issues.

6.2. Mr. Price reported on preparations for the 1997 World Radiocommunication Conference, WRC-97, which opens in Geneva later in the month. Paul Rinaldo, W4RI, is a member of the United States delegation; the ARRL is responsible for his expenses but he is, of course, obliged to adhere to United States policy at all times and to perform any functions to which he is assigned irrespective of whether the ARRL has an interest in the issue. Mr. Price, on the other hand, will attend as a member of the IARU delegation and is free to represent the IARU position at all times. Other IARU representatives will also be present, and the national delegations of Australia, Canada, and Japan are expected to include Amateur Radio delegates on a basis similar to that of Mr. Rinaldo. Mr. Price reviewed briefly the IARU objectives for WRC-97 and WRC-99.

6.3. Mr. Butler reviewed correspondence from the Friendship Amateur Radio Society, USA (FARS), an organization that promotes international events to bring together radio amateurs from different countries. FARS has asked that the ARRL appoint a coordinator to promote IARU-style Amateur Radio Direction Finding (ARDF) in the United States. After discussion, on motion of Mr. Butler, staff was directed to prepare a white paper on the subject for consideration at the next meeting.

6.4. The work of the ARRL Washington Office to investigate a possible allocation to the Amateur Service in the vicinity of 5 MHz was reviewed. Mr. Sumner was asked to prepare, prior to the next meeting, a paper outlining the steps to be taken to secure such an allocation.

7. Organizational matters:

7.1. Articles of Association and Bylaws:

7.1.1. It was agreed that because of the limited time remaining for this meeting, the review of Article 11 and of the Bylaws would be continued at the next meeting.

7.1.2. With regard to the assignment given

to the Executive Committee at Minute 54 of the 1997 Second Meeting, after discussion of the Final Report of the Governance Committee and on motion of Mrs. Craigie it was voted that the Executive Committee recommends to the Board the creation of the category of International member encompassing present associate members who are licensed but are not eligible for full membership.

7.1.3. On motion of Mr. Butler, it was voted to recommend to the Board the addition of the following sentence to Bylaw 35 as a new responsibility of the International Affairs Vice President: "He shall bring to the Board the concerns of members in other countries."

7.2. In July, Board members were asked to comment on draft ethical guidelines for members of the ARRL Board of Directors. After review of the comments received, it was determined that the draft merits further review and discussion by Board members. The draft will be redistributed to Board members with a request for comment prior to the January meeting of the Board.

7.3. Strategic Planning:

7.3.1. Mr. Sumner presented a report on the status of strategies previously adopted by the Board. Mr. Stafford said he will review the report and make assignments with regard to those items on which action has not yet been completed.

7.3.2. A document that had been given to the Board in July, suggesting how the League might develop a procedure for updating its strategic plan, was discussed. On motion of Mr. Heyn, it was voted that the President and Executive Vice President shall develop a plan to reinstate the strategic planning process along the lines discussed, to be brought to the next meeting for presentation to the Board.

7.4. In response to Minute 31 of the 1997 Second Meeting of the Board, President Stafford had assigned to Vice Director Bernie Fuller, N3EFN, the task of preparing a preliminary report on the development of endowment funds for certain essential ARRL activities. The preliminary report had been distributed to the Executive Committee prior to the meeting. On motion of Mr. Mendelsohn, it was voted to recommend to the Board that Mr. Fuller's report be used as the basis for further planning.

7.5. Mr. Imlay reported that the draft Alternative Dispute Resolution procedure would be shared with Volunteer Counsel for their comments shortly.

7.6. Draft "Guidelines for Responding to Mail or e-mail From Out-Of-Division Members" prepared by Mr. Mendelsohn were reviewed. It was agreed that comments on the draft should be solicited from the full Board.

7.7. Director Tod Olson, K0TO, had suggested that the agenda for ARRL Board meetings be organized more along topical lines. After discussion, it was agreed that Mr. Olson should be invited to share his thoughts on this subject in more depth.

7.8. On motion of Mr. Butler, it was voted to recommend to the Board that the Technical Excellence Award be renamed the Doug DeMaw Technical Excellence Award, as has been requested by several of the members who have earned this award.

7.9. On behalf of the Computer Committee, Mr. Mendelsohn reported that the committee invites Directors to make greater use of the telephone conference bridge at ARRL Headquarters. Ways to improve e-mail service to Board members are under consideration.

8. On motion of Mr. Heyn, 31 newly elected life members were recognized and the Executive Vice President was instructed to list their names in QST.

9. On motion of Mrs. Craigie, the following clubs were declared affiliated:

Category 1

Addison County Amateur Radio Association, Vergennes, VT

Calnet South Repeater Group, Corona, CA

Carson Valley Radio Club, Minden, NV

Central Area Repeater Association, Dresden, ME

Chaffee - Lake Amateur Repeater Association, Buena Vista, CO

Disaster Communications Repeater Association, Bakersfield, CA

Jupiter Tequesta Repeater Group, Inc., Jupiter, FL
Marion County Amateur Radio Society, Indianapolis, IN

McKean County Public Service Group, Bradford, PA
North Carolina Alligator Group, Gold Hill, NC
Northern Hills Amateur Radio Club, Lead, SD
Valley Center Amateur Radio Club, Valley Center, KS

Zekiah Swamp VHF Society, Bryantown, MD

Category 3

Cy-Fair High School Amateur Radio Club, Cypress, TX

Harrison High School Amateur Radio Club, Evansville, IN

Inland Valley Schools Amateur Radio Club, Ontario, CA

Category 4

International Hamfiesta, El Paso, TX

The ARRL now has the following numbers of active affiliated clubs: Category 1, 1982; Category 2, 27; Category 3, 163; Category 4, 11; total, 2183.

10. On motion of Mr. Butler, the holding of the following ARRL conventions was approved or their earlier approval by mail vote was ratified:
New England DXCC Convention, October 12, 1997, Chelmsford, MA

Mississippi State, February 7-8, 1998, Jackson, MS
West Texas Section, March 14-15, 1998, Midland, TX

Southeastern Division, April 18-19, 1998, Birmingham, AL

Midwest/Dakota Division, May 29-30, 1998, South Sioux City, NE

Arizona State, July 24-26, 1998, Flagstaff, AZ
Roanoke Division, September 19-20, 1998

(new dates), Virginia Beach, VA
Pacific Division, October 16-18, 1998, Concord, CA

Southern Florida Section, November 21-22, 1998, Tampa, FL

11. It was agreed that the Executive Committee will meet at 9:00 AM Thursday, January 15, 1998, at the Marriott Hotel, Rocky Hill, CT.

12. Other Business:

12.1 The Secretary noted for the record the following action of the Board taken by mail vote. The Election Committee had declared Nicholas R. Smith, WA4GKM, to be ineligible to be a candidate for Director of the Delta Division by virtue of a business connection of the kind that is prohibited by Article 11 of the ARRL Articles of Association. Mr. Smith appealed the decision to the Board. There were 13 votes to sustain the decision of the Election Committee, and two abstentions. Those abstaining were Directors Roderick and Gordon; all other Directors voted to sustain the decision of the Election Committee. Accordingly, the decision was sustained.

12.2. Mr. Imlay reported briefly on the status of an estate of which the ARRL is the principal beneficiary. A partial distribution of the estate is anticipated soon.

There being no further business, the meeting was adjourned at 6:27 PM.

Respectfully submitted,

David Sumner, K1ZZ

Secretary

LIFE MEMBERS ELECTED OCTOBER 11, 1997

Raymond A. Allard, K1MFZ; Henry W. Alvstad, Jr. K2XJ; Geoffrey Appar, W7JEZ; Louis Austin, KD4JSX; William Boedeker, KB5ZDV; Walt Bolte, N9BXR; Charles L. Cooper, N4TIS; Beverly L. Cossalter, N1OKG; Andres Crespo, WP4KYJ; Donna M. Dunneho Jones, KB4MYE; Peter W. Eaton, W5FP; William P. Fawns, KE6HEZ; Michael G. Graham, NE1V; Neil Halin, WA3RPG; James T. Harrell, N0OSV; Douglas W. Hogarth, N7MOK; Thomas R. Hone, AA0GP; William M. Johnson, KN6OT; John Kyriazis, N6VEG; Charlotte R. Lee, KC5DOR; Timothy W. Mays, N8ZDZ; R. M. McCubbin, WB6EQB; Steven C. McCubbin, KF6AOR; Hector L. Nieves, KP4LS; Chris Platt, VK3KCP; David A. Poulson, N7KFL; Stanley Slonkosky, KE6ZC; G. Clifton Smith, K6JN; Walter H. Statton, W7KNK; Stephen R. Stewart, N3UOB; Allan L. Yackey, WB9PKM.

QST

9N1UD On the Air!

By **Charles Harpole, K4VUD/9N1UD**
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Geneva, FL 32732
e-mail harpole@pegasus.cc.ucf.edu

My DXpedition dreams began with old textbooks in grade school, books so old that there were still "uncharted territories" marked in the geography maps. I wanted to go to those cross-hatched areas on the maps. When I became a ham operator as a teenager, there was additional reason to do so: I wanted to operate DX from those blank spots on the map!

After operating the July 1994 IARU contest from the US Virgin Islands, and a week spent with the FRC boys on V2 for another contest, I knew that combining my two favorite ham activities—contests and DX—was for me. I began collecting my DXpedition gear (antenna tuner, lighter weight linear amplifier, ICOM 706 transceiver, Astron dc power supply, and dipoles).

My opportunity came with the invitation from the Tsurphu Foundation to go to Tibet to make a documentary film about the Karma Kagyu Buddhists and their spiritual leader. The Tsurphu Monastery is 70 miles or so north of Lhasa. On July 4, 1997, I departed from Orlando and, many stops later, arrived in Katmandu, Nepal. I had a total of 31 hours on airplanes, and more than \$800 in excess baggage charges. In Katmandu, I waited to get acclimated to the high altitude (after starting at 36 feet in Florida). I would soon get a tour into Lhasa.

Operating from the Hotel

The hotel in Katmandu was great. The manager even helped me string the 20 meter dipole on the roof, the center held up by a bamboo pole. Prior to leaving, the ARRL had put me in touch with Satish, 9N1AA, as the contact for assistance with licensing in Nepal. He was great, meeting me at the airport and shepherding me through the 9N1 licensing process. I received the call sign 9N1UD and was ready to get on the air.

My operation netted more than 1600 contacts, all but one of which was on 20 meters, with nearly 400 of those coming during the IARU contest on July 12 and 13. Actually, I feel that I could have done more during the contest, but the pileups were too heavy. It's good to be rare, but being the only IARU Zone 42 station in the contest may have been a little *too* rare. Of course I operated split frequency, but I also found it necessary to call by the numbers to spread everyone out. That technique seemed to

work well, as it is very hard to call by countries or zones, especially when propagation is really good into only one or two countries. I recommend calling for "any ones," then "any twos," and so on. That seems to work regardless of the prefix. Also, I changed numbers with every contact so that the maximum wait time was nine contacts for another chance to call.

That procedure led to very orderly pileups. JAs were very disciplined, and it was quite gratifying to hear the whole pileup from Europe as well as elsewhere standby as I asked for USA stations. Propagation into the US was very poor, and often I received no answers to "USA only" CQs. I did work some CW, but again very few USA takers despite what I had been told is a huge demand. CQing on 40 meters yielded mostly QRN.

Dick, 9N1ARB, has a great fixed station in Katmandu, and it was wonderful to visit there as well. When in the country, he's on nearly every day, chatting with friends in VK and the Far East. What a treat to hear South Korea and Bangladesh coming in like locals (which they were, more or less). The UA and other CIS nations were also very strong, with 20 meters open virtually around the clock.

Dick hosted a get together for all the 9N hams while I was there, and all six showed up. We joked about the slim numbers, but the Minister of Communications was also there with promises of helping create more Nepalese hams. 9N1AA will be on the air again soon, after completing a change of quarters. He has some aspirations for satellite work too, but needs gear. Access to ham gear and to good mail service is a problem in Nepal, but the telephones work great!

After Nepal, I moved on to Lhasa. While I couldn't get permission for an Amateur Radio operation, I was able to get some wonderful still and moving picture shots. Now, I want to return there with a big film crew and get more footage.

The local hams were wonderful in Nepal, and the ham radioing from there was a blast. But can I keep up with the incoming QSL requests?

QSLING TIPS

QSLing is a chore that the DXers will always face. As the years have passed, however, the return rates have fallen. Many DXers lament their poor QSL return rate. Yet, as often as not, modern QSLing requires more attention to detail than ever

before. The DXer should use a method that makes it easier for the DX station to fulfill QSL requests, thus increasing the chances of success.


William Plum, of William Plum DX Supplies, 12 Glenn Road, Flemington, NJ 08822-3322, has put together a publication, *The SASE Method*, based upon the results he and his customers have obtained in securing those rare QSLs. As the title implies, it's based upon using foreign stamps and SASEs to send for those prized QSLs. Many of the testimonials boast returns of more than 90% over other methods, such as the Green Stamp and IRC.

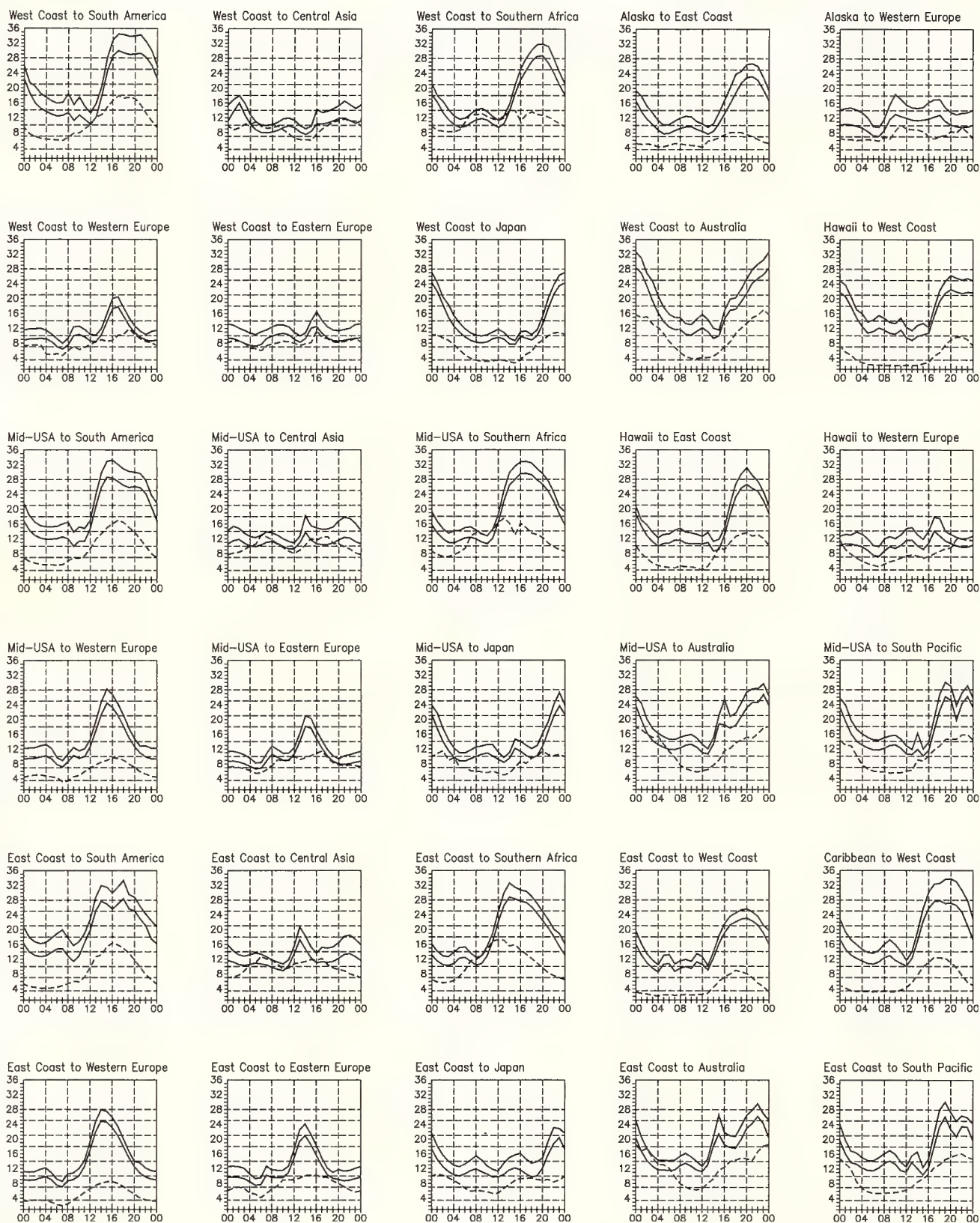
While the key to Plum's method revolves around the use of mint foreign stamps, there are more tips than just stamps. Many of them you may have heard for years, but probably have not tried. For example, use of two envelopes, one of which fits inside the other without folding. The envelopes should be the world-standard size, not a US no. 10. These envelopes blend into the world mail stream without standing out like a sore thumb as US envelopes do. This is a great deterrent to mail theft.

Preparation of the envelope is also important. Names and addresses should be printed, not written in script. Leaving the call signs off is a good idea; they tend to draw unwelcome attention. Placing the card inside the return envelope (don't seal the flap!), turning it upside down (so the letter opener doesn't cut the flap) makes for a tidy package.

Now think about how the DX station can handle the envelope. He doesn't have to address an envelope. He doesn't have to dispose of an IRC or Green Stamp to obtain postage (would you be in a hurry to go to the bank or post office to cash a Green Stamp or IRC?), and he doesn't have to lick stamps (ugh!). All he has to do is find the log entry, fill out the card, and it's out the door. You've made it easier for him to provide what you want.

The book has similar small tips for improving your returns. Anything that reduces your chances of having to QSL twice is bound to save money. The book is \$5, and includes a catalog of available stamps, envelopes and other supplies.

If you have access to the World Wide Web, you may also want to check out the Air Mail Postage site operated by James E. Mackey, K3FN, at <http://www.net1plus.com/users/ryoung/index.htm>. James sells return postage, envelopes, rubber stamps and more.—K5FUV 



When are the bands open? These charts, generated using IONCAP, show probabilities for average HF propagation from December 16, 1997 to January 15, 1998, for the paths indicated. The horizontal axes show Coordinated Universal Time (UTC), and the vertical axes show frequency in MHz. On 10% of the days of this period, the highest frequencies propagated will be at least as high as the upper curves, and on 50% of the days they will be at least as high as the lower solid-line curves. The broken lines show the lowest usable frequency (LUF) for a 1500-W CW transmitter. For SSB or a lower transmitter power, the LUF will be somewhat higher than the curves indicate. See October 1994 *QST*, pp 27-30, and February 1995 *QST*, pp 34-36, for more details. The predictions for this period assume an observed 2800-MHz solar flux value of 96.

Edited by **Bill Kennamer, K5FUV • DXCC Manager**

The ARRL DXCC is awarded to amateurs who submit written confirmation for contacts with 100 or more countries on *The ARRL DXCC Countries List*. The totals shown below are exact credits given to DXCC members from August 1 to 31, 1997. There were 329 current countries at that time. The DXCC rules and application forms are contained in the *ARRL DXCC Countries List*, available for \$2 from Publication Sales. The DXCC Web Site may be found at <http://www.arrl.org/awards/dxcc/>.

TOP OF THE HONOR ROLL

Mixed
329

JH1ORA/340

Phone

329

JH1ORA/338

CW

329

JH1ORA/334

NEW MEMBERS

Mixed
329

DS1BHE/125

DS5USH/132

EY8MM/314

HK3BZO/226

JA1DOF/119

JA1HP/166

JA1NJA/107

JA1RNH/123

JA3QG/140

JA4DC/121

JA4RYN/119

JE1VJT/120

JG2TKH/119

JH1SVO/112

JH2VHV/121

JH3PAS/120

JK2VOC/120

JK7BRH/120

JN6CYC/120

JO1TXS/119

JP1GHJ/120

JP4DAH/124

JP4PMX/118

JR6XIX/115

LX1JH/103

VE3TKI/131

7N2PYF/120

W1JO/153

K2JG/162

N2JIX/103

WA2VQV/107

N3NY/130

N3TBO/132

WA3WAW/102

K4VRT/112

WB4MOG/215

AB5QR/105

KJ6YK/106

WB6AXD/228

W6FY/106

Phone

CE8SFG/120

DS1BHE/119

F6GVS/178

HK3BZO/191

JA1EEG/107

JA1NEJ/114

JA1NJA/106

JA4DC/121

JA8YI/281

JA9XBW/106

JE1CPB/100

JE1VJT/120

JE0EHE/120

JG2TKH/113

JH1XJQ/138

JJ1JMK/118

JK7BRH/120

JO1TWR/127

JO1TXS/119

JX1GXS/120

KH0CG/113

OE3WQB/115

WB3FID/112
K4DDJ/164
N4EK/195
WE9A/292
K0OZ/213
W0ZZQ/187

CW

BV7FN/104

JA1DOF/112

JA1SNF/118

JA3QG/140

JA6VQA/105

JA8YI/312

JA9XBW/161

JF1IRW/103

JH1SVO/112

JH2NWP/129

JL1UXH/120

JN6CYC/120

JO3DUE/145

JK3QHO/127

OE1ZJ/325

JA1HP/166

W2OW/124

N5OL/110

KB6CO/101

N6QI/212

AA7UC/116

RTTY

JG3QZN/114

JR1RCQ/116

JH2VHV/121

K4NA/123

W4WX/124

Satellite

JH0BDK/102

JP1GHJ/120

JP4DAH/124

JP4PMX/118

JR6XIX/115

LX1JH/103

VE3TKI/131

7N2PYF/120

W1JO/153

OE3WQB/102

ON4ON/112

UU1JA/106

80 Meters

DS5RNM/133

JA1EMK/107

JA2QCX/118

OE1ZJ/276

W1PNR/125

KD2KS/141

WA2HZO/104

WB3LHD/102

WB3LHD/100

W3TN/134

AJ9K/109

WE9A/101

40 Meters

HK3BZO/110

JA1DOF/119

JA1SGU/108

JA2FGL/104

JE1VTZ/161

JH1SVO/112

JH1JNC/120

JL1UXH/108

JO3DUE/133

JK3QHO/127

OE1ZJ/325

SM7NDX/101

W3TN/120

W4VW/127

W4BIM/106

W5NWX/110

N6QI/184

NY7T/109

W2SP/104

KJ9O/105

WE9A/112

10 Meters

JA1EEG/107

JA1WPX/214

JA9FF/120

JG2TKH/119

JQ1VNM/110

OE1ZJ/305

K5ALQ/123

KI6T/150

NY7T/110

W8AEF/106

KJ9O/118

6 Meters

JA6SBW/107

JO1HQQ/103

JA1DIO/339

NEW HONOR

ROLL MEMBERS

Mixed

328

JA2CYL/328

JA3GSM/342

327

OE1ZJ/350

325

JE1PNX/328

324

JA1SGU/337

323

W57I/329

322

JA1QCA/335

JA1RNU/327

JA8YI/323

321

JA1EPL/327

W6OTC/326

320

JA1IRH/331

J1IDHY/324

K3OSX/324

K4QL/328

KB5WQ/327

K7TCL/332

Phone

325

IK0DWN/329

322

JR4LNG/326

7L1WII/325

320

JA1DIO/332

JO1MOS/324

CW

324

JI2KKX/327

321

JA1NWD/326

N4SU/329

320

JA1BNW/324

J12EMF/325

5B DXCC

AJ9K

CX3CE

IK0DWN

JA1NWD

JA6CY

OZ7DN

VE7EW

W2OW

W4IS

W4WX

WB3LHD

WE9A

12 Meters

K8IU

ENDORSEMENTS

Mixed

CE3GDN/302

DS5RNM/227

F3SG/325

F9XL/340

G3AEZ/330

G3VDL/256

IN3DEI/340

JA1BNW/347

JA1CLW/317

JA1DIO/339

JA1DJO/327

JA1EOD/355

JA1FGB/338

JA1FUI/308

JA1GYO/229

JA1HGY/351

JA1IL1/276

JA1JAT/280

JA1KNS/321

JA1KRW/322

JA1MJ/357

JA1MOH/344

JA1MZL/317

JA1NWD/333

JA1OHD/331

JA1QOP/338

JA1QWT/331

JA1SJC/323

JA1STF/323

JA1TNV/383

JA1VDJ/343

JA1VN/344

JA1WTI/348

JA1XEL/165

JA1XLU/293

JA1XXL/313

JA2AHH/335

JA2CUS/252

JA2FGL/332

JA2FMW/335

JA2HO/340

JA2JPA/320

JA2QCC/336

JA2QPY/334

JA2TBS/334

JA1CHN/330	JF1UUVJ/305	ON4ON/299	AD5A/283	OZ5MJ/218	K4QL/170	K5OVC/282	J12KXK/269	WF5E/232	JH1ORA/134
JA1CLW/242	JF2BNG/275	OZ5MJ/329	KB5OHT/248	WU1F/133	N4CH/158	K5UR/328	J11SKG/153	W5BPT/151	JH1SJN/312
JA1DIO/246	JF6OJX/319	SM5HV/HK7/317	KE5PO/302	W1CR/208	N4SU/270	K5XX/118	JJ2LPV/156	W5F/219	J11CQA/128
JA1DUH/306	JF6WBP/290		K5AS/335	KF2XF/140	W4UW/141	N5FG/183	JK7KIH/126	W5FKX/118	J11SKG/180
JA1EOD/333	JG1HND/321	SM7NDX/246	K5HAA/232	NK2H/215	W4VQ/129	N5QDE/116	JM1GAW/113	W5RUK/139	JJ2LPV/181
JA1EPL/153	JG1SFX/330	U11A/278	K5JZ/314	WE2K/139	K5UR/279	W5AIP/111	JM1GYO/126	W5TUD/118	JK7KIH/129
JA1FGB/330	JG1TCB/174	VE7EW/172	K5XX/239	WF2S/167	K6EID/163	WF5E/128	JN1MKU/141	KD6WW/296	JL1IHE/203
JA1FUI/249	JG3NKP/224	7L2VYT/198	WF5E/266	K3QIA/195	K8IP/182	W5BPT/121	JR1RCQ/118	K16T/172	JL1TXC/216
JA1HGY/334	JH1BAM/298	K1DPB/257	W5BPT/301	AA4US/147		W5F/145	JR4LNG/201	K6EID/311	JN3SAC/194
JA1HP/166	JH1BSJ/146	K1ER/282	W5F/315	K4F/309		W5TUD/141	ON4ACG/297	N16T/271	JR1BYG/142
JA1IL/149	JH1GTR/162	K1GW/279	W5FKX/317	K4Q/128		KD6WW/214	ON4ON/211	N6JM/155	JR1CQZ/128
JA1IRH/143	JH1IED/142	N1AC/323	W5N/311	W4VQ/279		K16T/136	OZ5MJ/202	N6JM/155	JR1RCQ/151
JA1JAT/272	JH1NRV/252	N1CPC/320	W5ZPA/336	KB5GL/308		K6EID/277	PY3JZ/257	W6OTC/128	JR4LNG/183
JA1KNS/299	JH1OGT/168	N1QY/304	KD6WW/321	KE5PO/277		N16T/224	UU1JA/132	K7NN/250	ON4ON/213
JA1KRW/180	JH1SJN/317	WA1WMS/225	K16T/294	K16T/294		K7NN/192	VE3FR/134	AGBL/163	OZ5MJ/203
JA1MOH/325	JH1XUP/160	WU1F/178	K6CU/318	K5KR/323		AG8L/123	VE3OU/169	K8BN/215	OZ7DN/203
JA1MZL/254	JH2SON/184	W1TSP/320	K6ID/325	K5JZ/146		K8BN/178	K1DPB/155	AA9DX/166	PY3JZ/159
JA1QCA/220	JH2TP/120	K2RW/319	K6VL/287	N5GGO/311		WZ8P/123	K1GW/168	AJ9K/126	UU1JA/157
JA1SGU/313	JH3HTD/298	K2SO/334	K6Z/311	W5F5/188		AA9DX/130	K1UO/233	KU6A/162	VE3FRR/148
JA1SJC/302	JH1CQA/253	NK2H/132	N16T/314	W5BPT/173		N4C/122	K2XO/206	K02M/111	ZS6JHS/140
JA1STF/303	JH1DHY/209	N2CG/138	N6JM/279	W5F1/184		K2XO/192	N1QY/241	N0RR/323	K1GW/180
JA1VDJ/210	JH1GYC/230	WA2HZO/326	WD6L/149	KD6WW/196			W1TSP/136		K1UO/218
JA1VN/338	JH1NJO/178	WB2J/221	W6FAH/312	K6EID/264			K2ENT/288		N1AC/141
JA1WSX/311	JH1PGO/334	WC2C/143	W6JJS/221	N16T/131			K2RW/280		WR1X/144
JA1WTI/319	JH2FAP/219	WE2K/135	W6OTC/282	W6OTC/282			K2SO/271		WU1F/185
JA1XLU/240	JH1JGI/156	WF2S/203	K7NN/196	K7NN/196			K2Z/215		KF2F/155
JA2AHH/262	JH1SKG/192	W2RIJ/206	KY7M/328	W5T/289			NK2H/115		K2ENT/285
JA2CUS/155	JJ2LPV/303	K3IX/332	K7NN/332	AA9DX/290			WA2HZO/275		K2RW/125
JA2FGL/310	JJ2MST/130	K3OSX/311	NY7T/223				WB2V/171		NK2H/158
JA2QCC/127	JK1VSL/127	K3QIA/285	WG7A/285				W2RIJ/112		WA2HZO/260
JA5MOO/210	JK7KIH/263	WA3I/214	WB7CLU/181				K3IX/256		WE2K/157
JA6LCJ/320	JL1BYZ/149	WB3LHD/257					K3OSX/266		K3OSX/235
JA7AO/308	JL1IHE/184	W3TN/263					WB3LHD/146		AA4ZK/222
JA7IC/322	JM1GYC/280	AA4NG/327					AA4NG/115		JA1WSX/227
JA7JI/323	JM1JIV/301	AA4US/222					AA4US/168		JA1WTI/282
JA7JT/270	JN3SAC/299	KB4GYT/289					AA4ZK/128		JA2AHH/153
JA7TQK/306	JO1MOS/188	K4JLD/315					K4QL/303		JA2FGL/168
JA9CGW/246	JO2UQ/161	K4PIC/256					K4ZIN/209		JA2TBS/133
JA9IFF/183	JQ1VNM/170	K4QL/316					K4ZIN/136		JA2WYN/224
JA9AMN/149	JR1BAS/230	K4VW/185					N4AA/192		JA7IC/129
JA9BJR/299	JR1BYG/159	K4ZIN/259					N4CH/293		JA7TQK/254
JA9BKX/324	JR1CQZ/144	K4ZO/176					N4SU/320		JA8CVW/317
JA9UMV/216	JR1DNH/234	N4AA/230					W4VQ/334		JA8NPQ/281
JE1CTA/333	JR1EFG/240	N4CH/319					AD5A/167		KD5ZM/175
JE1LFX/245	JR1XFS/174	N4D/326					K5OHT/166		K5JZ/127
JE1PNX/236	JR1XIS/330	N4VN/170					KE5PO/166		WF5E/220
JE1REU/280	JR2BNF/317	WD4KMV/266					K5AS/122		W5BPT/190
JE1VTZ/274	JR5VHU/230	W4IS/176					K5JZ/184		W5FKX/136
JE2OVG/330	OE1TKW/282	W4OGG/156					JF2BNG/203		N16T/236
JE2SOY/155	OE2BZL/228	W4USN/225					K5OVC/291		K7NN/298
JF1PUW/333	OK2SW/283	W4UW/284					K5UR/333		WZ8P/151
JF1SEK/335	ON4ACG/307						K5XX/192		KZ0X/137
							N5FG/265		JH1IED/308
							N5QDE/129		JH1OGT/151

New Products

RG303/U CABLE ASSEMBLIES FROM CABLE X-PERTS

Two RG303/U 50-Ω coaxial cable assemblies (6 feet and 18 feet long, respectively) are now available from Cable X-perts. Both feature PL-259 connectors at each end, which are soldered and tested for RF and mechanical integrity. Longer lengths and bulk spools are also available.

RG303/U is a high-temperature, high-power teflon coax with a solid silver center conductor and a mil-spec silver braid shield. It's rated for 6 kW PEP (1.9 dB loss per 100 feet at 30 MHz).

Prices: 6-foot assembly, \$14.95; 18-foot assembly, \$24.95, plus \$6.75 for USA shipping (lower 48). For more information, contact Cable X-perts, 416 Diens Dr, Wheeling, IL 60090; tel 800-828-3340, fax 847-520-3444, e-mail cxp@ix.netcom.com; <http://www.cablexperts.com>.

DAVIS INSTRUMENTS

Davis Instruments, a manufacturer of

weather instrumentation systems since 1988, announces the availability of *Weatherlink 4 for Windows*, which gives ham operators new tools and features for working with Davis Home Weather Stations, including improved support for packet radio.

New features include automatically updated strip charts, automatically generated NOAA-type "weather watcher" reports, an improved plotting interface, calculated weather data that's not available on the Weather Station's electronic console, support for the Automatic Packet Reporting System (APRS), and more.

Weatherlink 4 works with IBM-compatible systems running *Windows 3.x*, *Windows 95* and *Windows NT 4.0*. Prices: Complete package, \$165; Upgrades for existing users, \$49. For more information, contact Davis Instruments, 3465 Diablo Ave, Hayward, CA 94545; tel 510-732-9229, fax 510-732-9188; <http://www.davisnet.com>.

WEATHER SERVICE "SPECIFIC AREA MESSAGE" DECODER FROM MORRIS SOFTRONICS

The National Weather Service Area Message Decoder (NWSAMD) allows users to decode Specific Area Message Encoding (SAME) data from the voice channel of any 160-MHz weather service receiver. The device is microprocessor-controlled and is configured via its RS-232 serial port. Configuration data is stored in non-volatile memory.

Designed primarily for Skywarn, ARES and repeater service for retransmitting NWS bulletins and information, the NWSAMD provides switched audio, PTT and control inputs/outputs. The factory assembled PC-board module is powered by 8 to 16 V dc and comes with a detailed user guide.

Price: \$149.95. For more information, contact Morris Softronic, Box 48, Hooper, NE 68031; tel 402-654-2482, e-mail msftrncs@htcnet.com; <http://www.htcnet.com/msftrncs>.

Rick Palm, K1CE • Field Services Manager

Hospital Emergency Communications— Fulfilling the Mission

By April Moell, WA6OPS
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With the development of new commercial communication products, there has been increasing discussion of new missions for Amateur Radio. An important mission exists for our service that isn't new, but is unfulfilled. Many ARES or RACES groups, when asked, would say they support local hospitals. However, that support is usually poorly planned at best.

Often, the only support hams provide is telling hospitals what ham equipment to install. Then they simply wait for someone to tell them to go to the hospital in a disaster. As a result, hospitals don't realize that hams can help in other communications emergencies, such as isolated phone outages. And hospitals become an afterthought when an area-wide disaster hits.

Hospitals are vital organs in every community. Because of their important role in day to day, not to mention in area-wide emergencies, they should have the highest priority for communications support. Even though hospitals have emergency phones, pay phones, cell phones, and walkie talkies, none can fully replace the main telephone system. Ham operators can support communications from unit to unit in a hospital and link the hospital to the outside world.

Mass casualty incidents and area-wide disasters are not the only situations in which back-up communications are needed for hospitals. Any telephone system failure in a hospital is a disaster too. The potential for serious consequences to patients is high. When patient care is at stake, hospitals need every resource possible. Amateur Radio can be a vital resource, provided that hams prepare and plan thoroughly.

Thus the mission: supporting communications that are critical to patient care.

A Working Model

Since 1980, the Hospital Disaster Support Communication System (HDSCS) has provided communications backup to hospitals in Orange County, California. Interest started with one hospital; now 36 facilities are supported. Each facility has formally requested the involvement of Amateur Radio.

HDSCS is a special ARES group. Operating under ARES frees us to interface

directly with private and public hospitals at all times. It is important to be able to respond to hospitals individually when they request and to self-dispatch in accordance with designated plans in an area-wide emergency. There are no intermediaries under ARES. HDSCS has a memorandum of understanding with Orange County RACES for occasions when hospital emergency communication to and from government entities are required.

HDSCS has two components. The *Call-Up* system activates members for phone outages and mass casualty incidents. The *Core Team* system is a mechanism by which members self-dispatch to nearby hospitals in area-wide emergencies.

Hospitals activate a call-up responder on their list when a communications problem occurs. A group page number is also provided for hospitals to use if calls are unanswered or there are limited opportunities to make calls. The first HDSCS operator contacted takes over, putting the system in motion to rapidly get responders to the hospital.

Core Teams are made up of individuals who have committed to respond to assigned hospitals without first being called when a major area-wide disaster strikes. Core Team responders do not take on assignments from other ARES/RACES groups that they belong to unless cleared from HDSCS first.

Keys to Success

Since 1980, HDSCS has responded to 60 hospital communication emergencies. The group is recognized in the county's Mass Casualty Medical Response Plan. We are members of the three hospital disaster drill planning committees and also participate in the county's Disaster Advisory Group. This level of acceptance didn't just happen, we earned it. Several factors led to this degree of credibility and success. Some are:

1. Preparedness. HDSCS hams are ready to respond from home, from work, and when on the road. There's no time to rummage through the shack to figure out what to take. Whether or not the hospitals in need have external antennas or radio gear doesn't matter, HDSCS hams prepare as if there will be none. We have often had to do communications from unit to unit, using our own portable gear and flexible capabilities.

2. Consistency. Many members have been with the group for more than 10 years. Four coordinators have been involved since the beginning. Many hospitals know our responders by name, and the committees we attend know us too. As a result, the hospitals keep us in mind. That leads to being called out, not just in emergencies, but for stand-by operations when phone systems are being upgraded, and for public service activities like hospital-sponsored 10-K runs.

3. Training. Members of HDSCS learn about the unique communication needs of hospitals. Meeting programs feature presentations on county emergency medical services, hospital departments, procedures and much more. We drill with each hospital at least once a year, testing the activation procedures as well as our communication links.

4. Multiple channels. One repeater or simplex frequency for hospital communications is not enough in most scenarios. Alternates are needed for high traffic levels and when primary repeaters are inoperable or unavailable. Autopatch capability is a plus. Patches have been vital in several phone outages. At one point during a 1996 response following a switch-gear failure, traffic was being relayed out on the main net frequency, an internal unit-to-unit net was in progress on simplex, and urgent calls were being made from the Emergency Department and Intensive Care Unit via autopatch on two different repeaters.

5. Reliable tactical voice communications. Over 99% of our inter-hospital and intra-hospital communications are short, point-to-point tactical messages. Many involve contacting physicians and staff, both inside and outside the facility. Requests for supplies, whether within the hospital or to an outside source, have almost always been for less than three items. On many occasions, we give the microphone to a hospital staff member for third-party communications. Packet radio and ATV may be exciting modes, but when it comes to supporting hospitals, voice communications are what is needed.

Making a Difference

To date, HDSCS has responded 179 times to Orange County hospitals. Sixty of these have been emergency callouts for phone failures and activations for earth-



Jean Creason, KC6PPY (standing), assists the Incident Commander at a hospital command post during a mass casualty drill.

quakes, flooding and fires. The remainder have been stand-by operations and drills.

By making the effort to learn, prepare, drill and respond, we have made a difference—a difference that has positively affected people's lives. Our emergency messages have included orders for blood, a "stat" (immediate) request for medication from the Neonatal Intensive Care Unit to the Pharmacy, an urgent call for a physician to assist in an emergency Cesarean section, and a call for priority response from the power company to a hospital when its emergency generator failed after an earthquake.

The bottom line is patient care. In Orange County, Amateur Radio plays an important role.

HURRICANE WATCH NET HOME PAGE UP

The Hurricane Watch Net home page is up and running at <http://www.weathernode.com/hwn/>

The page provides current hurricane advisory information. Advisories are downloaded directly from the GOES satellite via the EMWIN/Weathernode system. Current data will be available on the page within seconds of it being transmitted from the National Hurricane Center in Miami. Suggestions and comments are welcome.

Thanks to Jerry Johnson, WA3WZF, President of Maryland Radio, for donating the server space for the page and for production assistance. Thanks also to Jim Doherty, N3KHJ, of the National Weather Service EMWIN project.—*Jerry Herman, N3BDW, Hurricane Watch Net Manager*

HAM HUMANITARIANS AT WISCONSIN SPECIAL OLYMPICS

By Joe Larson, N9JW

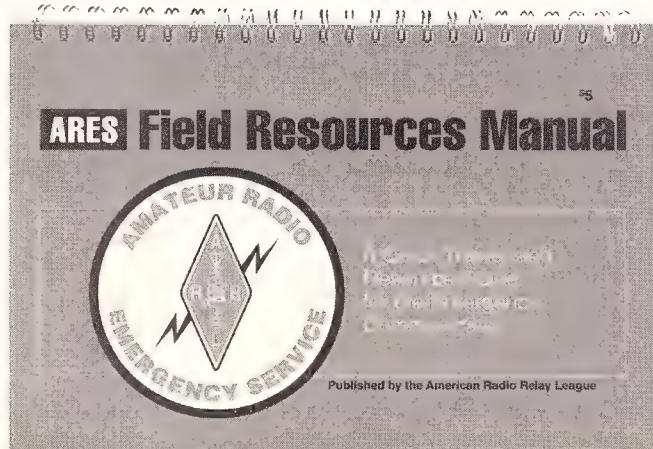
The man was sitting down in Tournament Central, holding a hand over his face. He was crying. A track volunteer had her arm around him. "Don't worry, Roger, we'll find your coach."

Roger Trent was 60 years old, with wispy gray hair. He had become separated

Great Gift Idea: The ARES Field Resources Manual

The *ARES Field Resources Manual* has been a big hit among the rank-and-file ARES community. This manual is intended to serve as a quick trainer and reference for amateurs involved in emergency services work, primarily through the Amateur Radio Emergency Service (ARES) in their communities. It provides basic program information on ARES and

RACES, forms, operating aids, and templates to be customized for the local area to include reference information such as important phone numbers, emergency frequencies, maps, organizational details, and so forth. It would make a nice gift for your favorite emergency communicator this holiday season. \$5 plus shipping. All ARRL publications are available from your local ARRL dealer or directly from ARRL. Mail orders to Publication Sales Dept, ARRL, 225 Main St, Newington, CT 06111-1494. You can call toll-free at 888-277-5289; fax your order to 860-594-0303; or send e-mail to pubsales@arrl.org. Check out the full ARRL publications line on the World Wide Web at <http://www.arrl.org/catalog>.



from his coach in the crowd at the Wisconsin Special Olympics summer games in Stevens Point. He knew he was supposed to compete in the 100-meter walk at 2 PM, and he told a volunteer about it. The volunteers know that they can bring lost athletes to the ham radio operators at Tournament Central, so she brought Roger to us.

"What is your coach's name, Roger?" Judy, one of the hams, asked. "I don't remember," replied Roger in a quivery voice. "Well, that's okay. Let's just get your agency number and look her up." She patted his shoulder.

Pat, the other ham operator, picked up a microphone. "Track Announcer, this is Tournament Central."

After a couple of seconds, Peter, the ham operator stationed near the track public address system, boomed back, "Track PA here."

"Peter, please have them announce that a coach from agency 9-22 should come down to Tournament Central and pick up an athlete, Roger Trent."

"Okay, will do."

It was almost 2 o'clock and Roger was going to miss his event.

Two thousand adults and children, all with developmental disabilities, participate in the Wisconsin State Special Olympics summer games, which are held on campus at the University of Wisconsin-Stevens Point in June each year. The athletes have to qualify in regional and sectional meets to make it to the state competition. Many of them train year round in their events; all of them work hard for months to make it. Missing an event is a disaster.

With family, friends, coaches, and volunteers, over 6000 people are on campus during the games. Many of them are strangers to the campus and to the city. Central Wisconsin hams come out every year to help coordinate communications among the event venues, to keep volunteer medical staff connected, and to help unite lost and found coaches and athletes. We help the games run smoothly.

It was my turn to roam around the campus with my hand-held radio. Our distinctive yellow shirts say "Amateur Radio Emergency Communications" on the back, so people stop us with questions, ask for directions, and show us their medals. I left Roger with Pat and Judy and headed out of Tournament Central and into the hot, sunny day.

Walking the crowded campus, I heard the PA, "Will Roger Trent please report to the yellow staging area immediately." I jerked my head up. Then I grabbed my microphone.

"Tournament Central, this is N9JW."

"Go ahead, Joe."

"I just heard Yellow Staging announce that Roger Trent is to report there immediately."

"Thank you very much!"

Judy told me later that Roger got to his event on time. Afterward, he had his coach bring him back down to Tournament Central to thank us. Beaming with pride, he said, "You helped me get this medal. You are the greatest. If I ever get lost again I am going to come right back here!" The sunlight through the windows flashed off the shiny silver disc as he turned it so we could all see.

Field Organization Reports September 1997

Section Emergency Coordinator Reports

There are 40,367 ARES members accounted for in SEC records. The following section emergency coordinators reported: AL, CT, ENY, GA, ID, IN, KY, MDC, MI, MN, NFL, NC, NV, TN, VA, VT, WMA, WNY, WV.

National Traffic System

Net	Sess	Tfc	Avg	Rate	% Rep	% Rep to Area
Cycle 2 Area Nets						
EAN	30	669	22.30	0.590	89.0	
CAN	30	359	12.00	0.440	93.3	
PAN*	60	360	6.00	0.340	91.7	

Region Nets

1RN	60	803	13.38	0.732	98.0	100.0
2RN	30	289	9.63	0.469	94.4	96.7
3RN	30	125	4.16	0.370	100.0	96.7
4RN	60	201	3.35	0.240	72.0	96.7
RN5	60	571	9.51	0.607	92.0	100.0
RN6	31	39	1.26	0.202	82.0	93.3
RN7	60	406	6.76	0.350	69.7	100.0
8RN	60	193	3.21	0.334	100.0	100.0
9RN						100.0
TEN	60	516	8.60	0.580	52.0	100.0
TWN	43	96	2.23	0.340	69.0	81.6
ECN						46.7

RN6 HF Digital mailbox traffic: 207.

Cycle 3 Area Net

EAN	30	150	5.00	0.364	77.1	
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Region Nets

1RN	30	63	2.10	0.279	95.2	93.3
2RN	30	64	2.13	0.358	98.9	73.3
3RN						96.6
4RN						50.0
8RN						86.6
ECN						96.6

Cycle 4 Area Nets

EAN	30	805	26.83	0.194	95.7	
CAN	30	377	12.57	0.754	100.0	
PAN	30	468	15.60	0.662	88.9	

Region Nets

1RN	59	246	4.17	0.464	96.4	100.0
2RN	52	153	2.94	0.440	96.0	100.0
3RN	51	129	2.53	0.270	78.3	93.3
4RN	60	550	9.16	0.574	78.0	100.0
RN5	30	343	11.43	0.620	89.2	100.0
RN6	60	256	4.27	0.650	77.5	100.0
RN7	60	386	6.43	0.504	98.6	100.0
8RN	57	203	3.56	0.280	92.0	96.6
9RN	60	209	3.48	0.480	97.0	100.0
TEN	60	265	4.42	0.420	75.8	100.0
TWN						66.7
ECN	31	186	6.00	0.588	72.0	93.3
ARN	30	31	1.03	0.035		86.6

*PAN operates both Cycles 1 and 2.

ARRL Section Traffic Managers reporting: AL, AR, AZ, CT, DE, EBAY, ENY, EPA, EWA, GA, IA, ID, IL, IN, KY, MDC, MI, MN, NC, NFL, NH, NLI, NNJ, NTX, OH, OR, OK, SBAR, SC, SD, SDG, SF, SFL, SNJ, STX, TN, VA, WI, WMA, WNY, WPA, WV, WWA.

Transcontinental Corps

Area	Successful Functions	% Successful	TCC Function Traffic	Total Traffic
Cycle 2				
TCC Eastern	93	77.50	238	490
TCC Central	115	95.80	286	290
TCC Pacific	104	86.67	249	404
Cycle 3				
TCC Eastern	28	100.00	n/a	30
Cycle 4				
TCC Eastern	102	97.14	187	712
TCC Central	50	83.30	98	208
TCC Pacific	104	87.00	332	682

NTS Digital Traffic Total: 4868

TCC Roster

Eastern Area, Cycle 2: KW1U, Director. N1DHT W1FYR KF1L N1OTC KT1Q KW1U W2FR W2G KA2GVJ N2LTC W2MTA KA2VZX N2XJ KA2YZM N3DRM N3EFV KK3F N4ABM AA4AT WX4H K4MTX N4SS WD8LDY K8TPF WD8V KA8WNO WB8YDZ.

Eastern Area, Cycle 3: W2FR, Director. N1OTC W2FR W3OKN AA4AT WD8LDY K8TPF KA8WNO.

Eastern Area, Cycle 4: W2FR, Director. KF1L KW1U KT1Q N1FT N1OTC W1CE W1FYR W1NJM KA2GVJ KA2VZX N2JAW N2LTC W2CS W2FR W2GKZ W2MTA W2RQ KK3F N3COR N3DRM K4SCL K4WJR N4GHI N4SS W4UQ WB4KSG K5TF N6ANQ K8TPF KA8WNO W8JWX W8PMJ W8UQ WB8YDZ WD8V VE3AWE.

Central Area, Cycle 2: N0FBW, Director. W5JDF (SK), N5IKN W5KLV K5MXQ W5QFU K5SV W5YQZ KE5ZV W6VW N0FBW W0FE WB0WJN.

Central Area, Cycle 4: K5GM, Director. K5GM K5MC K5RG W5TFB K5SV K5BW N9CK W9FC K9PUI WA9QCF N0SM. Pacific Area, Cycle 2: KT6A, Director. KT6A W6DOB N6GIW K7BDU K7VVC KA7YYR.

Pacific Area, Cycle 4: W7GB, Director. W6EOT W6QZ W6VZT K6YR WA7EES KA7EKL W7EP W7GB W7GHT KB7GZU NN7H W7LG W7VSE W7ZIW K0EZ K0TER V67CTW VE7DOWG.

NTS Digital stations: W1FYR WB2FTX N2JAW N2LTC AD4DO W4EAT KQ4ET WX4H W4KAU N4SS K5DPG K5MXQ N5NAV W5NRJ K5QST N5TUK K5SV W5YQZ WB5ZED N6GIW W6QZ N9ANL W9CBE N0FBW N0ZO VE3BDM.

Public Service Honor Roll

This listing is to recognize amateurs whose public service performance during the month indicated qualifies for 70 or more total points in the following 8 categories (as reported to their Section Managers). Please note the maximum points for each category: 1) Checking into a public service net, using any mode, 1 point each; maximum 60. 2) Performing as Net Control Station (NCS) for a public service net, using any mode, 3 points each; maximum 24. 3) Performing assigned liaison between public service nets, 3 points each; maximum 24. 4) Delivering a formal message to a third party, 1 point each; no limit. 5) Originating a formal message from a third party, 1 point each; no limit. 6) Serving as an ARRL field appointee or Section Manager, 10 points each appointment; maximum 30. 7) Participating in a communications network for a public service event, 10 points each event; no limit. 8) Providing and maintaining an automated digital system that handles ARRL radiogram-formatted messages; 30 points. Stations that qualify for PSHR 12 consecutive months, or 18 out of a 24-month period, will be awarded a certificate from HQ upon written notification of qualifying months to the Public Service Branch at HQ.

949 NM1K	175 K7VVC	149 W2MTA	135 K4IWW	123 WB0WNJ
352 WA1TBY	148 KE4AZL	148 KE4CS	11ST N2XQJ	KA1GWE
KA2VZX	173 W3YVQ	WB5NKC	N8FPN	N4JQA
327 KA4HHE	171 KB5GLV	KB2VSD	N5OUJ	122 N2FHJ
W9RCW	KA5TTO	KT1Q	KE4OAV	WBJWX
296 WD8V	170 147	WX4H	134 KC3Y	W4DGH
286 N2OPJ	AE4EC	134 WB2GTG	KB2UKF	W7GHT
K5IQZ	W6VW	WX8Y	133 KJ9J	11DHT
AD4BL	K2YAI	KB1A	KA7AID	KB2UKF
267 W6DOB	KC4ZHF	WN0Y	7GXZ	KT6A
262 K9FHI	W5RZV	146 121	133 KJ9J	11DHT
N2LTC	WA4QXT	143 143	133 KJ9J	11DHT
KC5OZT	168 144	AF4NC	WB4TVY	KD4PDK
258 KL7Q	151KN	KB2VYD	KD4PDK	K2GNZ
WB2UVB	KA2GJV	KB2VSD	KD4PDK	K2GNZ
255 K4SCL	KB5RUG	KA9KLZ	132 132	132 132
243 WA1JVV	167 143	143 143	132 132	132 132
N24O	W9YCV	AA2ED	132 132	132 132
218 AD4BO	142 142	KB2KLH	KG2D	11CPX
W7TVA	166 166	WA1FNM	WB2ZCM	WA4NDA
212 KA2ZNN	K5DPG	W12G	130 130	130 130
208 K2UL	N1LKT	KE4JHJ	9NBDL	118 118
AA2CX	KD4SIV	141 141	W7LG	WB8LDY
206 KC5QGI	163 163	N2RPI	K2BCL	WB8IMX
204 N1OTC	AB7NK	WB1GXM	129 129	129 129
KA2YZM	KD4TOK	140 140	W3OKN	KB5TOH
201 161	KA9EIZ	W7VSE	W7VSE	WA4EIC
N2YJZ	KA1VEC	W0OTF	128 128	128 128
198 AB6EU	139 139	K4CWZ	KJ3E	KA1JXH
WA9VND	160 160	K4CQX	WB2WYE	117 117
194 W9CBE	W0LAW	W7UOF	N2ZH	N8FWA
KC4RNF	W7ZIW	KB2WII	127 127	127 127
W4ZBA	N1VXP	KD4GR	KB2CDB	116 116
193 KB8ZYY	N2OJI	AA4HT	W6QZ	W9UMH
K6YR	158 158	KF2YC	138 138	138 138
191 K9DHR	156 156	KI4YV	AA2SV	W4AET
KA4FZI	AB2RE	W8DHC	W7DRP	114 114
190 N5NAV	154 154	W8IMX	K5WEG	WA1CSO
188 N2FET	KG6TU	K2TII	W5YQZ	180 180
N2WFN	151 151	KB7JQM	178 178	178 178
180 151	150 150	W2HOB	K7BDU	
W7WAT	151 151	K7JKL	NR2F	
178 150	136 136	K7BDU	WB5ZED	

113 W1ALE	106 KE4NAY	KG7LS	AE4WP	KD4TON
KB5UCQ	K4TTTT	K3UWO	89	N8TXL
112 WB7VYH	96	K4LRM	WR8F	AB5RV
AG9G	105 KE6GFV	104 K10JO	87	78
WA8DHB	K54FB	KF1L	WA1QAA	N4JTG
KC5QZZ	104 K10JO	W2PIL	KB2GEK	KR4ZO
WB2EAG	KB9ENO	KD4JMV	86	K1SEC
111 WA0TFC	103 K4JMV	95	K1FP	WD4LZ
K9GBR	KD4FUN	KN4US	KN4US	77
KB1AF	KN4OH	W0MZI	KN4HGU	KF4BDY
N1SGL	W7NWP	W4XI	WA5FXQ	76
110 AA9HN	KC5PNM	84	75	N5BMB
W2MTO	103 K4VIA	KE4PAP	KE4PAP	K4BEH
N3RB	KE6MIW	N3WKE	N3WKE	W4NTI
KF4DUS	102 WB4PAM	WA4GLS	WA4GLS	N8TDE
KE3FL	W4PIM	94	K7MOF	K8SH
K5VNC	AA2NX	KA2DBD	W7PFD	74
KG5GE	K8ZJU	WB2JH	KB2ETO	N2ZMZ
109 KE4DNO	93	N2JRS	N2JRS	KC5EKK
WA2CUW	KD4DHU	K4AIF	N1TDF	WY3K
W4QAT	KC6SKK	W2AZ	KA1VAX	73
WB8KWD	101	KD4JMA	KA1OTN	KE4RLL
WA8SSI	K04OL	WA6DQK	WA4EYU	W7UVP
N8DD	KD6YJB	N6GIW	KK5WG	WB5CXK
KB2KOJ	100	82	82	72
108 N3RVX	92	AA8SN	AA8SN	N4MM
N9KHD	KB9GGA	N3WK	WA4UGD	NB2D
WD0GUF	K8IG	N8JSO	KE4SCU	K8WC
KB8ROA	KB2UQZ	91	81	70
N7YSS	99	K0IBS	W2CC	N2FHK
KT4SJ	K5AO	K8AMPD	80	N2SOE
K0ERM	90	KA0DBK	80	KB2YBM
KA1WCD	98	WB2CZW	79	KB2VSR
WB5YDD	KF4NFP	KB2RTZ	AF4CD	KT4XA
97	KA9FVX			N1ZFF

The following stations qualified for PSHR during the month of August, but was not listed in the column in last month's issue: N1VXP 139, N3WKE 91.

Brass Pounders League

The BPL is open to all amateurs in the US, Canada and US possessions who report to their SMs a total of 500 points or a sum of 100 or more origination and delivery points for any calendar month. All messages must be handled on amateur frequencies within 48 hours of receipt in standard ARRL radiogram format.

Call	Orig	Rcvd	Sent	Divd	Total
NM1K	790	533	1135	43	2501
W1FYR	0	784	794	2	1580
N2LTC	0	434	569	1	1004
WB0WNJ	0	396	599	5	1000
WX4H	2	389	434	15	840
KA2VZX	54	315	340	120	829
K9JPS	3	432	42	312	789
W9IHW	3	457	31	288	779
K7BDU	53	289	385	7	734
WB9JSW	0	395	39	280	714
WA9VND	9	351	319	21	700
KA1VEC	22	311	335	31	699
K7VVC	21	281	301	66	669
W3VR	264	190	210	21	685
W9RCW	0	306	148	189	643
W1PEX	1	512	126	2	641
N5IKN	0	300	76	226	602
AA2CX	12	158	373	48	591
W3CUL	210	98	260	20	588
W6DOB	33	189	294	66	582
KT1Q	0	279	276	10	565
K1EIC	0	268	268	7	543
KT6A	2	270	233	4	509
KA2YZM	24	285	177	22	508
W3KOD	0	286	216	2	504

BPL for 100 or more originations plus deliveries: KI5QZ 223, KK5QT 140, KC5OZT 124, K4SCL 117.

Independent Nets

Net Name	Sess	Tfc	Check-ins
Amateur Radio Telegraph Society	30	224	440
Amateur Radio Telegraph Society (20M)	30	4	121
Bears of Manchester	30	401	290
Central Gulf Coast Hurricane Net	30	35	2067
Clearing House Net	27	38	211
Empire Slow Speed Net	30	141	334
Hit and Bounce Net	30	294	597
Hit and Bounce Slow Net	30	126	459
IMRA	26	442	1201
Midwest RTTY Net	30	142	278
Mission Trail Net	30	80	877
Pennsylvania Phone Net	30	102	288
Southwest Traffic Net	30	62	1089
Sunbelt Service Net	23	48	2272
West Coast Net	30	43	232
75 Meter ISSN	30	81	827

Worldwide Propagation on 6 Meters?

Since early autumn, it has become clear that the sun has awakened from its slumber and has begun to reenergize our ionosphere. Ten meters was open on many days in late September and early October from the US to South America, Africa, the Pacific, and even to Europe. Six meters began to show some life of its own with an upsurge in transequatorial activity, including contacts from Florida to Argentina. Can true 6-meter F-layer DX be far behind?

The New Cycle

It is still too early to place a definitive date on the birth of Cycle 23, but evidently it has been underway for more than a year now. The Space Environment Center of the National Oceanic and Atmospheric Administration (SEC/NOAA), the premier research center for solar and atmospheric physics, provides two indicators of the solar minimum. According to the number of sunspots, the minimum occurred in May 1996. The lowest part of the cycle according to the longest stretch of days on which there were no sunspots was in October 1996. The final determination is yet to be made, yet it is clear the minimum has passed.

Predicting the behavior of the new Cycle 23, including the peak date and maximum smoothed sunspot number (or 10.7 cm solar flux), is not easy. There are at least six different prediction methods, but most rely on analysis of previous cycles. The methods that have proved most accurate in the past suggest that the peak of Cycle 23 will be about as great as Cycle 22, which was the third highest on record. One analysis, which takes into account that odd-numbered cycles have been larger than the immediate preceding cycles, suggests that Cycle 23 will exceed Cycle 22 and could be the highest ever.

SEC's official prediction for Cycle 23 is shown in Figure 1. It indicates a peak smoothed solar flux of about 210 occurring in mid-2000. (In comparison, Cycle 22 had a double peak and a maximum smoothed flux also about 210.) If these predictions for Cycle 23 prove accurate, they suggest that worldwide propagation on 28 and 50 MHz should be at least as good as it was 10 years ago. So when will we start hearing worldwide propagation on 6 meters?

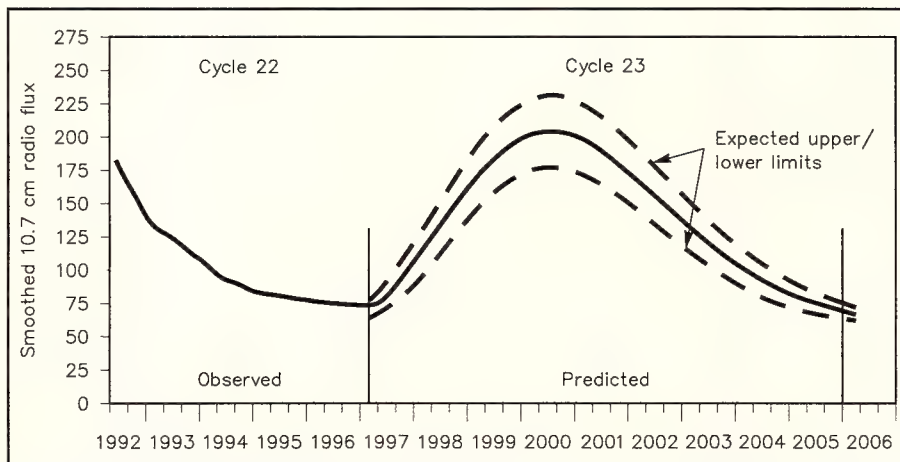


Figure 1—Prediction of the smoothed 10.7 cm flux for Cycle 23 was published by the Space Environment Center of the National Oceanic and Atmospheric Administration in June 1997.

Solar Flux and 6-Meter DX

There is no one-to-one correspondence between solar flux, even the daily flux value, and the MUF (maximum usable frequency) over any path. It is a more complicated matter because many variables are involved. Time of year, signal path, daily solar flux, condition of the geomagnetic field, and operating conditions—including transmitter power, antenna, and local noise all play a role. Sophisticated computer propagation prediction programs take into account these variables, but unfortunately most break down when attempting to predict an MUF as high as 50 MHz.

Even so, there are some general guidelines that can aid in anticipating conditions on 50 MHz. Six meters opens for worldwide DX primarily between October and May, with the best conditions in December and January. The daily flux must be high, perhaps 125 or greater even for the easiest paths, such as the US to South America. The daily flux must exceed 200 just for a 50-50 chance of propagation between the East Coast and Europe, although it has been open with the flux as low as 130. More difficult northerly paths, like the East Coast to Japan, require even higher flux levels.

The highest daily MUF is generally ob-

served just after noon at mid-path. Thus, 6-meter propagation between the US and Europe usually occurs only for a few hours during the late mornings. Openings over the easier path from the US to South America generally last the longest, sometimes extending from mid-morning to late-afternoon. Openings across the continent take place around noon, and those from the US to the Pacific are afternoon events. Conditions deteriorate over most paths when the geomagnetic field is at storm levels (A index above 30 or K index 4 or higher), whatever the solar flux.

Solar flux, in other words, provides a general indication, but it is also necessary to keep in mind season, time of day, and specific paths. Study the propagation charts published each month in the "How's DX?" column to find the times for the peak MUF over any particular path. Although the charts may not show the MUF actually reaching 50 MHz, the times will accurately show when this is most likely.

What Can We Expect Next?

There is a sequence of 6-meter propagation events that can help gauge the general progress of the solar cycle. The first indication is an increase in transequatorial (TE) contacts on 50 MHz. TE is a special F-layer phenomenon that supports contacts up to 8000 km perpendicular to, and equidistant from, either side of the geomagnetic equator. The most common TE contacts from the southern US, adjacent Mexico and the Caribbean are with Argentina, Uruguay,

*Send reports to Emil Pocock, Box 100, Lebanon, CT 06249. Leave voice messages at 860-642-4347, or fax 860-594-0259 or e-mail w3ep@arrl.org.

This Month

December 6-7	Good EME conditions
December 13	Geminids Meteor Shower Peaks

and Chile. TE appears most commonly during the fall and spring equinoxes and may be enhanced by geomagnetic storms. TE has already picked up considerably this past fall. Read the "On the Bands" section below for reports of phenomenal TE activity this September.

The first signs of true F-layer propagation will be contacts that cross the regions of highest F-layer ionization, which form around noon in two thick bands 15° or so either side of the geomagnetic equator. Thus, the first F-layer contacts from the US are likely to be to the northern part of South America, to South Africa, and to Australia. Contacts in other parts of the world that also cross the equatorial regions are likely to appear in the early reports. The daily solar flux requirements for these paths are quite modest—perhaps as low as 125 to 150. The latest SEC predictions suggest that some daily solar flux values should reach this range by the fall of 1998.

As F-layer ionization increases, it becomes possible to complete contacts at more northerly latitudes. The next most likely paths will be from the East Coast to Europe and the East Coast to West Coast. The daily solar flux normally required for these contacts is at least 150 to 175. Such values might occur during the winter of 1998-99, but it is more probable the following year. The most difficult contacts are those that cross even higher latitudes, such as the East Coast to Japan and the West Coast to Europe. Flux requirements are even greater and may have to wait until the peak of the cycle, predicted for the year 2000.

Comparison with Cycle 22

Another way to gauge the progress of 50-MHz propagation is to compare actual conditions during Cycle 22 with the predictions for Cycle 23. The first widespread openings from the US to Europe and from coast to coast during Cycle 22 occurred in December 1988. The smoothed 10.7 cm radio flux had barely reached 125 at the time (but some daily values reached 150 and higher). According to the SEC prediction for Cycle 23, the smoothed 10.7 flux will reach that same level as early as mid-1998. This analysis suggests that some worldwide DX could be possible by next fall and winter.

Truly spectacular worldwide openings took place in the fall of 1989, when the smoothed solar flux was above 175 and some daily flux values exceeded 200. Six meters was open to Europe two days out of three from November 1989 to January 1990, and there were a number of openings from the US to Japan and the Pacific islands. The equivalent position for Cycle 23 is predicted for late 1999.

Long-range forecasts provide only a framework for anticipating what might be possible. The best way to discover openings on 50 MHz is to monitor the radio daily

and follow the MUF up from 28 MHz. You may want to chart your own receptions against daily solar flux and geomagnetic indicators. Several WWW sites also provide near real-time satellite data, including actual X-ray levels. There is also a site that provides a real-time MUF contour map, which might prove useful for watching the MUF approach 50 MHz. You'll find the map at <http://solar.uleth.ca/solar/www/realtime.html>.

Nothing is certain, but several predictions indicate that there will be some good possibilities for real 6-meter DX by late fall next year. Stay tuned!

ON THE BANDS

The big activity stories of the month were the exceptional tropospheric openings that affected much of the eastern half of the country and the many days with transequatorial propagation on 50 MHz around the world. Dates and times are UTC.

Ducting

Tropospheric conditions were quite exceptional throughout the Mississippi and Ohio valleys during September, as a series of sluggish high-pressure systems moved across the country. Most of the reported contacts were on 144 MHz, but ducting supported contacts nearly as distant up to 1296 MHz. The activity summarized below was all on 144 MHz unless otherwise noted. Thanks to KH2CY/4, K4MSG, W4UE, AA9AO, NA9N, KW0A, KD0PY, and W0PHD whose reports also contributed to these summaries.

The opening of September 3 and 4 extended from northern Georgia to Kansas and north to the Canadian border. Andrew Kozlowski, VE3JIX (EN29), worked south through Iowa, Missouri, and Oklahoma. His longest contact was with W0PW (EM26), at around 1450 km. Arliss Thompson, W7XU/0 (EN13), worked widely from Ohio (EN80) to the east, south to Georgia (EM74) for his longest contact with KA2KQM/4, and southwest to the Texas panhandle (DM95).

Good tropo conditions were on hand for the VHF contest, September 14-15, over an area extending from Minnesota and eastern South Dakota, south to Kansas and Missouri, and east to Ohio and Michigan. Jon Jones, N0JK (EM18), found very strong 144-MHz stations from the twin-cities area of Minnesota and worked N0QJM (EN13) on 1296 MHz.

Widespread ducting covered large areas of the eastern half of the country between September 19 and 22. Russ Holshouser, K4QI (FM06), worked a remarkably wide area on 144 to 1296 MHz. His contacts ranged north to New Hampshire (FN43), west to Iowa (EN31) and Missouri (EM38), and south to Florida (EL97). Russ's longest contacts were in the 1300-km range. During the same period, Chris Vincent, KB4OGM (EL49), found conditions good on 2 meters all along the Gulf Coast from EL88 and EL89 in Florida west to Texas grids EM00 and EM11.

Extraordinary ducting reappeared on September 25. K2SMN (FN20) in New Jersey found many stations from Ohio to Missouri, Iowa, and South Dakota. His best contact with W0SD (EN13) was about 1850 km, one of the longest contacts of the evening. W0SD thought the opening was the best tropo event he had heard in many years from South Dakota. He worked stations as far as western New York and western North Carolina. His longest contact was with W3OID (FM28) in Delaware at about 1925 km. Darryl

Petersen, KD0PY (EN41) in Iowa, made many contacts as far east as New Jersey, Pennsylvania and Maryland grids FN20, FM29 and FM19 on 144 and 432 MHz. Further south, Robert McGraw, K4TAX (EM75) in southwestern Tennessee, worked westward to Oklahoma and north Texas over paths up to 1250 km.

Some of the longest tropo contacts of the month came during the opening of September 26 to 28. Sam Whitley, K5SW (EM25) in eastern Oklahoma, worked progressively to the northeast during those three days. On September 26, Sam had made it north to EN13 and west to EM75 in east Tennessee. The following evening, he extended his range to EN34 in Minnesota, EN53 Wisconsin and EM89 Ohio. By September 28, Sam was working into western New York grids FN02, 03, and 11 at distances up to 1700 km. He worked VE3AX (FN02) and VA3ST (FN03) on 222 and 432 MHz as well as 144 MHz.

By the third day, the opening had extended as far as southern New England, enabling Ron Klimas, WZ1V, and Del Schier, KD1DU (both FN31) to work west as far as Kansas. WZ1V worked W0JRP (EM27) for his best DX on 2 meters at about 1950 km. KD1DU also found W0JRP and N0QXC (EM27) along with WD0BBU (EM28). These are some of the longest tropo contacts made between New England and the Midwest in a long time.

50-MHz Transequatorial

The fall and spring equinox periods are prime for transequatorial field-aligned irregularities—TE for short. This unique F-layer phenomenon creates 5000 to 8000 km paths across the geomagnetic equator. The effective MUF for these contacts is much greater than the normal F-layer. As the solar cycle begins its upward swing, TE becomes more intense, allowing contacts on 50 MHz and even higher. True TE can be worked from as far north as the lower tier of the United States into Argentina and Chile. TE-to-sporadic-E links can create longer paths.

The number of TE reports for September was overwhelming, thanks to CO2KK, CO2OJ, JA1VOK, LU6DRV, PY2NI, VK3OT, WB2QLP, WP4O, and Internet Six News. Contacts were reported over each of the common TE paths: southern Europe and the Middle East to south Africa; the Caribbean and Central America to South America; and Japan to Australia. The only reported TE contacts from the US came on September 30, when WB2QLP (EL96) and possibly other stations in south Florida had QSOs with CX4AAJ, PY3PT, and PY5CC.

Good TE conditions have continued into October, with the addition of some apparently true F-layer contacts on 6 meters. More about that next month. Here are the September summaries. Virtually all contacts were made during late afternoon and early evening, local time.

50-MHz TE Contacts in September

Day	Country	Prefixes
11	JA	VK
12	HP, TI	LU; V7—KH6
13	4X	—7Q; V7—KH6
14	V7	—KH6
15	CO, HP, TI, HK	—LU
20	HR, TG, XE	—PY
21	JA	—VK8
22	V5	—I; JA—VK8
23	7Q	—9H; KP4—LU, CX, PY; JA—VK8
24	XE	—LU
25	VR	—VK8
26	YV	—LU; VR—VK8; JA—YD
27	JA	—VK3,5
28	YV, KP4, XE	—LU
29	JA	—VK8
30	KP4	—LU; W4—CX, PY; JA—V7, VK8

50-MHz Standings

Band standings for 50 MHz are compiled each October 1 for publication in the December issue. At least 50 countries worked are needed for inclusion. To be included in this list, you must also have submitted information within the previous two years. You don't have to work additional stations to remain in the standings, but please confirm your continued interest. You can submit data by e-mail to: standings@arrl.org. Paper submissions can be sent to Steve Ford, WB8IMY, ARRL, 225 Main St, Newington, CT 06111. New reporting forms are available from the same address with a self-addressed stamped envelope.

Call Sign	QTH	States	DXCC	Grids	Best DX (km) [†]	Call Sign	QTH	States	DXCC	Grids	Best DX (km) [†]	Call Sign	QTH	States	DXCC	Grids	Best DX (km) [†]
K1TOL	ME	50	132	821	—	WB4MLE	AL	50	73	214	—	N8XA	OH	50	91	—	—
WA1OUB	NH	50	132	725	14,982	WS4F	GA	50	69	375	16,288	K8UNV	OH	50	76	—	—
W1RA	MA	50	130	—	—	WB4JEM	FL	49	69	348	13,585	WA8RCN	OH	—	70	—	—
K1GPJ	ME	50	120	700	—	K1FJM/4	FL	49	69	200	—	KU8Y	MI	50	51	502	13,683
W1JR	NH	50	111	552	14,455	N4TL	NC	—	60	—	15,034	—	—	—	—	—	—
W3EP/1	CT	50	109	651	15,750	NA4I	GA	49	55	450	8,850	WB8YFE/9	IN	50	90	600	13,766
KA1A	NH	50	105	—	14,533	WD4MGB	FL	50	54	185	14,388	WF9X	WI	50	80	310	—
W1AJM	VT	50	97	335	14,928	—	—	—	—	—	—	W9JUV	IL	50	78	362	—
W1EJ	NH	50	93	417	14,924	W5FF*	NM	50	128	850	—	K9LCR	IL	50	71	418	—
NZ1D	MA	50	69	—	—	K5CM	OK	—	121	—	—	W0UC	WI	50	65	566	—
—	—	—	—	—	—	N5KW	OK	50	116	—	—	—	—	—	—	—	—
K2MUB	NY	50	116	—	—	W3XO/5	TX	—	113	—	—	N0LL*	KS	50	92	713	14,901
WA2BPE	NY	50	107	—	15,390	W5VY	TX	50	112	362	15,060	K0GJX	MN	50	90	309	13,818
W2CNS	NY	50	104	452	15,120	W5QZI	TX	50	107	750	15,141	K0US	NE	50	83	—	—
K2OVS	NY	50	61	306	13,000	WASIX	TX	50	105	384	14,592	KM0A	MO	50	79	705	15,313
WA2BAH	NY	49	58	436	11,040	WD5K	TX	50	102	802	14,927	K0TLM	KS	—	76	—	—
KA2MCU	NY	49	50	383	11,040	K5SW	OK	50	97	—	—	W0JRP	MO	50	69	523	—
—	—	—	—	—	—	K5AM	NM	50	94	682	15,744	W0KEA	CO	—	65	543	—
W3JO	PA	50	120	—	14,929	WA5JCI	TX	50	91	624	—	K0FF	MO	50	55	453	12,761
W3WFM	MD	50	119	680	14,038	N7JJS/5	LA	50	81	591	—	K0CJ	MN	50	55	—	—
W3BO	PA	50	109	514	12,840	W5SXD	TX	50	70	—	—	—	—	—	—	—	—
K3QMX	PA	50	105	416	15,626	W5AL	TX	—	64	531	—	VE1YX	NS	50	138	700	15,499
AE3T	PA	50	90	—	14,500	WA5VJB	TX	50	56	—	—	VE9AA	NB	49	75	500	—
W3ZZ	MD	50	90	524	12,700	W5UWB	TX	50	55	—	—	—	—	—	—	—	—
WA3HMK	PA	50	79	—	—	WA5QCP	TX	50	54	326	—	GJ4ICD	—	36	160	716	17,040
WA3DMF	MD	50	75	507	11,645	W5ZN	AR	50	53	385	10,550	G0JHC	—	30	136	600	15,395
K3EAV	PA	50	53	—	12,838	N5BBO	TX	50	51	481	12,095	SM7FJE	—	20	140	626	—
—	—	—	—	—	—	WB5FCR	TX	50	50	175	—	N16E/KH6	HI	50	105	515	19,684
K4CKS	GA	—	123	642	—	—	—	—	—	—	—	VK30T	—	25	103	355	—
W4OO	FL	50	112	525	—	K6QXY*	CA	50	107	—	15,555	JA9BOH*	—	5	72	—	—
K4IG	FL	50	109	—	15,000	N6CA	CA	50	96	—	—	ZS6AXT	—	—	90	—	—
W4UE	FL	50	106	269	15,000	N6XQ	CA	50	91	—	16,000	XE1GE	—	48	60	—	14,078
N4CH	VA	50	104	616	15,000	K6UM	CA	50	57	401	15,560	—	—	—	—	—	—
N4MM	VA	50	101	668	—	—	—	—	—	—	—	— Information not supplied					
K4GOK	VA	50	83	—	—	W7HAH*	MT	50	58	617	—	* Includes some EME (moonbounce) contacts					
N4KWX	VA	50	81	522	13,946	N7DB	OR	50	52	450	13,800	† terrestrial					
K6EID/4	GA	50	74	538	14,566	—	—	—	—	—	—						

CO2OJ (EL83) reported an unusual 6-meter contact with HC2FG (FI07) on September 20 at 2100, with 59+ signals. The distance was about 3360 km. The Ecuadorian also worked several W4, 5, and 8 area stations, according to CO2OJ. These contacts could not have been via TE, because they were entirely north of the geomagnetic equator. The path geometry and time were consistent with normal F-layer propagation, but the solar flux that day would not have normally yielded an MUF as high as 50 MHz. Thus, the propagation mechanism is uncertain. Complicating the picture are the reports of shortwave listener Fernando Garcia in Monterrey Mexico (DL95). He reported hearing many FM broadcast stations in the 88 to 108-MHz band from Honduras and Nicaragua (2300 to 2450 km distant) at just about the same time. These receptions were entirely consistent with sporadic E, even if the season was a bit unusual. They were probably impossible by any known F-layer mode. Just what was going on that day is thus a bit of a mystery!

Sporadic E

There was a sharp drop in 6-meter sporadic-E activity during September, as expected. Nevertheless, VE7SKA (CN88) reported a short opening on September 14 after 1500, which allowed stations in the Pacific Northwest (CN85, 86, 87, 88, 96) to make contact with southern Manitoba and Saskatchewan grids DO20, 21, and 70. N0LL (EM09) found NX4R and WB2QLP in Florida on the 18th, for the only sporadic-E opening Larry noticed during the month. John Butrovich, W5UWB (EL17) worked XE1NVX (EK09) on September 28 at 0107.

Aurora

There were two aurora sessions during the

month. Operators in the Northeast reported the September 3-4 session as early as 2100, but 6 and 2-meter propagation extended only as far south as northern Virginia and west to Illinois. W7XU (EN13) worked WB8AUK (EN80) on 144 MHz around 2230 and VE3AVS (EN58) at 0139, but Arliss was distracted by the tropo opening then in progress. VE7SKA (CN88) made several 6-meter contacts into DO31 and DO33 after 0100. W7XU had some aurora on September 21 after 2100, but there were no other reports of this event.

NOTES FROM ALL OVER

Two-Meter Beacons in French Polynesia

Jack Henry, N6XQ, reports that FO5JL has a beacon on 144.150 MHz from the island of Morrea (BH52gq). This is 4150 km south of Hawaii and 6575 km from Los Angeles. It runs 24 hours a day with 10 W and a nine-element Yagi 15 feet above sea level pointed 30 degrees, or roughly toward southern California. It identifies itself every 10 minutes with 10 WPM CW.

This beacon has the potential to allow discovery of new tropospheric ducting and transequatorial paths. The ducting effects of the Hawaiian high pressure system may extend far enough south to cover the islands of French Polynesia and Southern California at the same time, especially in winter. The chances for TE propagation on 144 MHz from Morrea to Hawaii may be possible, but the distance is shorter than any reported 2-meter TE to date. The Morrea to California TE path seems less likely, because the required path geometry (equal distance either side and perpendicular to the geomagnetic equator) cannot be met.

Even so, Hawaiians and Southern Californians may want to program 144.150 MHz into

their scanning sequences from now on. TE is most likely in late afternoon around the spring and fall equinoxes. With the upswing of the solar cycle, the next few years ought to be ideal for watching TE over these and other paths that cross the geomagnetic equator over distances of 5000 to 8000 km.

A second beacon on Tahiti, using the call FO5OK, is also planned for 144.150 MHz. That beacon could run as much as 100 W to two nine-element Yagis. Its transmissions would be coordinated with FO5JL. Eddy Tchung (FO5OK) is eager to have any reception reports from either beacon. Contact him by e-mail at rava@mail.pf or telephone 689-426464.

Six Meters in Libya

5A1A has been on 50 MHz for two years, but the two operators of the station have made few contacts with their TS-690 and R7 vertical. For nearly two weeks beginning August 30, OE6DGG operated from Tripoli as 5A28 using an IC-706 MkII and a Yagi. Gunter made more than four dozen sporadic-E contacts into Europe, giving many operators a new country. Among the prefixes in his log were 9H, F, DL, PA, ON, G, HB, I, GJ and GW—including many well-known calls. Libya should be an easy country to work from North America as the solar cycle rises.

VHF/UHF/MICROWAVE NEWS

New Laser Record

Howard Sibert, KC7AED, claimed a new Helium-Neon (red) laser distance record of 192.4 km in an article that appeared in the San Bernardino Microwave Society newsletter, distributed in September. On September 21, N7VUB and KC7AED set up on Four Peaks, Arizona, while WB7VVD and KC7PCV went to Smith Peak to

Jeff's auroral-E experiences are probably not unusual, but rather the normal early evening conditions in the auroral zone. There are just a few VHF stations in that part of the world to make use of this reliable propagation mode. Jeff will help make up for that with another trip to northern Manitoba grids EO16 and EO26, planned for November 26 to 29 (just about the time you read this). He will have 400 W on 144 MHz and 100 W on 50 MHz. If you are within 2000 km of his locations, look for Jeff on both bands!

Bob Larkin, W7PUA, reported more than a dozen 10-GHz contacts over 400 km by various stations in Washington and Oregon over the past summer. The longest was 664 km between W7LHL (DN17kn) and W7PUA (CN82xw), made over an extremely rugged path on August 2. Other stations participating in these contacts were NU7Z, KD7TS, W7YOZ, and K7VHF. It's good to know of 10 GHz activity from the Pacific Northwest.

Northwest.

Strays

A black and white photograph of three men in business suits standing together. The man on the left is wearing a light-colored suit and a patterned tie. The man in the center is wearing a dark suit and glasses, and is holding a framed certificate or award. The man on the right is wearing a dark suit and a patterned tie. They are all smiling at the camera.

Joe, W3QLC, reports that a two-year effort by hams, especially ARRL members and officials, in Minnesota finally resulted in a new Amateur Radio license plate for motor vehicles. The effort, led by Joe and State Government Liaison Bill, KØOT, led to the introduction of a bill by Rep Mark Holsten (R, Stillwater) that resulted in the change. The main change was to add the words "AMATEUR RADIO" in place of the old, familiar "10,000 LAKES" motto. Displaying the new Minnesota ham tag are (l-r) Joe Hibberd, W3QLC; Minnesota Section Manager Max Wendel, NØFKU; and Rep Mark Holsten, sponsor of the bill.

BNF/BNF Century Club Awards

Compiled by Bill Moore, NC1L, Century Club
Supervisor

	50 MHz		W7AH	625
	<i>100</i>		NW7O/DM18	300
891	N3PUR		NW7O	300
892	N0SIN		WB8YFE	600
893	K4ABN		WA9LWJ	350
894	KC5WCO			
895	KD4HLG		144 MHz	
896	KO4MM		<i>100</i>	
897	KB9JIF	539	K42KQM	
898	N4TYP	540	WA4LOX	
899	KM5HL	541	N0QJM	
900	N5QS	542	W7XU	
901	K3DMG	543	NW7O	
902	N5WL	544	NW7O/DM25	
903	KC8ERC	N0QJM	125	
904	N8WXQ	K1VYU	125	
905	WB5JHK	N4KWX	150	
906	KC5LOW	W7XU	150	
907	WA4KXY			
908	WT3P			
909	N2SQW		432 MHz	
910	KD4MYE		<i>50</i>	
911	KE4MPV	271	K4YA	
912	KB4LCR	272	N5MYH	
		273	N8KOL	
G8BQX	375		WA2TEO	90
VA3DPB	150		WA9LWJ	60
KW0T	225			
N0HJZ	300			
W0PVL	225		1296 MHz	
W0JRP	525		<i>25</i>	
KS0F	500	126	N0HJZ	
W3EP/1	600	N0HJZ	40	
WA2TEO	500			
N3KFV	150			
KB4LCR	125		2.3 GHz	
KE4SIX	150		<i>10</i>	
KD4BOO	175	61	WA2TEO	
KD4MYE	150			
KO4MM	200		Satellite	
WA4GLV	250		<i>100</i>	
KC5ICS	200	74	K3DMG	
KM5HL	125	75	VE3EYR	
KC5LOW	125	76	N5XYN	
WD5ITW	250	77	N2SQW	
WA7PDC	175	K3DMG	150	

The Internet—Repeater Connection

By Murray Green, K3BEQ
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The idea of Internet connections to Amateur Radio grew out of an article by James Millner, WB2REM, in the December 1996 *QST* ("A New 'Band' For Your Radio"). Since then there has been a growth, albeit small, of repeater connections to the Internet by enterprising amateurs. These "pioneers" have combined Amateur Radio with cyberspace in a very direct way, creating new global gateways! There have been several articles in *QST* concerning the repeater-Internet connection, but none have touched on *operational procedures*.

Calling And Connecting

Amateurs calling into a repeater from the Internet should operate no differently than local users. Once the connection is established, announce your presence as you would if you were using a radio. It helps to let everyone know where you are and how you are reaching their system. "K3BEQ, listening via the Internet from Cheverly, Maryland."

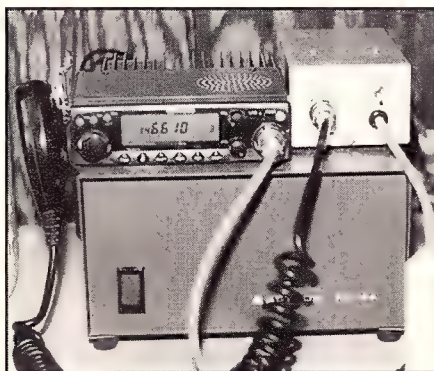
If you're on the repeater side, remember that repeater access from the Internet is normally *automatic* and does not require manual intervention. An operator can pop on the air at almost any time. You may simply be listening one day and hear a call from, say, Paris. "F6ABC listening!" To answer the call, just pick up your microphone and respond as you normally would.

Repeater access to the Internet can only be done manually by the local interface operator. That is, you must ask the interface operator to make a connection.

Personally, I enjoy using the Internet to bridge one repeater to another. Then you have whole groups of people in distant locations enjoying roundtable chats. When the interface operator announces that two repeaters are linked through the Internet, that's your cue to state that you are listening. Add your location to your announcement, especially if the connection is international. "K3BEQ in Cheverly, Maryland, United States, listening!"

Transparent

The actual connection to the Internet is *transparent* to the repeater's normal operation. In essence, the repeater is not connected to an Internet-based amateur until that amateur actually accesses it. Therefore, calling "CQ Internet" from the repeater side is a waste of time. Unless your



This is the compact interface system that I use to link the Internet to the Green Mountain Repeater Association's 146.61 and 146.88 MHz machines near Washington, DC. The small box sitting next to the transceiver was designed and fabricated by Joe Nunemaker, KD3VR.

repeater is already linked to another repeater, no one will hear you. It's like yelling "Hello!" into the telephone before anyone actually calls you!

When the Internet link is in use, it doesn't tie up the repeater—unless a QSO is in progress, of course. An Internet user can connect to the repeater and just listen if he or she prefers; this has no impact whatsoever on the repeater. On the other hand, a connection from an Internet listener *does* prevent others on the Internet from connecting to the repeater. That situation may change very soon. New technology is available that will allow more than one Internet user to access the repeater simultaneously.

Delay Times

When an Internet amateur turns it over to a local station to transmit, there is a longer delay than normal until the repeater reset tone is heard. Please be *patient* and wait for the tone to avoid repeater time-out. The extra delay is created by the time necessary for the interface VOX to drop out first, which then releases the repeater enabling the reset tone to be heard.

Conversely, when a local user turns it over to the Internet amateur, the repeater will usually drop out completely before he can begin to transmit. A short delay may also be experienced at this time before the Internet station begins to speak. This is caused by the various Internet connections including satellite relays. Based on our experience it varies from 5-20 seconds

after each transmission. As before, *patience* is the key.

Call Sign Checks

When an Internet amateur tries to access the repeater, software instantly checks the amateur's call sign "off the air" and permits or denies repeater access. The call sign search is usually conducted using an online data base such as QRZ, Buckmaster, UALR, etc. Although FCC Part 97 regulations do not specifically address Internet—repeater connections, ample guidelines are contained on page 7-6 of *The FCC Rule Book* published by the ARRL.

It May Sound a Little Strange...

You'll notice a wide disparity in Internet audio quality. It varies according to which sound cards and audio interfaces are in use. Internet line delays (e.g. packet losses) may create an odd stuttering effect at times. That is, there may be a loss of syllables or words followed by a pause, with the words put back together when the audio returns.

Is it Just Apathy?

Internet-repeater networking has been overdue in this country. But despite the advantages, hams have been slow to warm up to this new mode of communication. There may be several reasons for this...

- A feeling among certain amateurs that this is not "real radio," but merely a sophisticated type of reverse autopatch.
- New technology intimidation.
- Fear of change.
- Lack of experience in international conversations.
- Limited number of amateurs operating from the Internet with the required software. (This results in an insufficient number of contacts to inspire regular use.)

Explore and Enjoy

I don't believe that the Internet-repeater connection will be as revolutionary as the repeater explosion of the early 70s—but it is a worthwhile technological addition. Internet linking offers a taste of DX to hams who might otherwise not have an opportunity. It also offers incentive to upgrade for those who are not presently licensed to operate HF. If you have an Internet-linked repeater in your area, try it! Explore this fascinating new technology.

Who knows? If you listen carefully you might just catch that heavy-set guy with the red suit and the reindeer. You never know who will show up on a linked repeater!

Region 3 Conference Bridges the Pacific

Modern Amateur Radio did not exist in the People's Republic of China until 1982. How far it has come in just 15 years! At the Ninth Conference of IARU Region 3 held in Singapore in 1994, Beijing was selected as the site of the Tenth Conference in September 1997. The staff and volunteers of the Chinese Radio Sports Association proved themselves to be up to the task of hosting an international conference; the meetings went smoothly, and the delegates gained new friends in China and a taste of the wonders of their ancient land.

A preliminary report on the conference appeared in *Happenings* last month, page 75. One conference action that may warrant reporting in more detail is its handling of the issues relating to Article S25, the section of the international radio regulations that relate specifically to the Amateur and Amateur-Satellite Services and are on the tentative agenda for the 1999 World Radiocommunication Conference.

In early 1996, IARU President Richard Baldwin, W1RU, appointed the Future of the Amateur Service Committee (FASC) to guide the formulation of an IARU position on Article S25. The FASC issued a discussion paper in April 1996, reported prior to the Region 1 Conference in Tel-Aviv in October 1996, and provided a further report prior to the Region 3 Conference. All three of these documents are available at the IARU Web site at <http://www.iaru.org>.

Following extensive discussion in one of its major Working Groups, the Conference resolved that Region 3 will submit comments to the FASC making the following points:

- The fundamental characteristics that distinguish the Amateur Services from other radiocommunication services are,

first, their non-commercial nature, and second, that the participants are operators having demonstrated qualifications. The service-specific regulations should reinforce these characteristics. Yet, the existing regulations offer little guidance to administrations as to the appropriate qualifications for an amateur operator's license.

- It is desirable that the role of the Amateur Services as a disaster communications resource be recognized explicitly in the radio regulations.

- It is desirable to delete from the service-specific regulations those provisions that also appear in the regulations of general application, and the provision relating to the banned country list.

- In its second report, the FASC had suggested a possible new approach to the construction of Article S25, including the offering of more detailed guidance as to operator qualifications in a separate ITU Recommendation that could be incorpor-

ated by reference into the radio regulations. The Conference found the new approach to be agreeable with minor editorial revisions, but urged that if incorporation by reference is used, the qualifications should be mandatory and not optional for administrations.

The Region 3 Conference position with regard to Article S25 is completely consistent with the policy adopted by the ARRL Board in January 1997 (March 1997 *QST*, pp 58-60).

The next opportunity for in-person discussion of the evolving IARU position with regard to Article S25 will be the Region 2 Conference, to be held in Venezuela in September 1998.

STATE DEPARTMENT APPLIES FOR US CEPT PARTICIPATION

The State Department has applied for US participation in the European Conference of Postal and Telecommunications Administrations (CEPT) Amateur Radio licensing system. The move, September 22, could eventually make it easier for US hams to operate temporarily in European countries that participate in CEPT. Holders of a CEPT license could operate in CEPT-participating countries without having to apply for a reciprocal license.

"No doubt there will be some give and take between the European Radiocommunications Office (ERO) and the Department of State over the details before the US is accepted as a participant, but an important milestone has been reached," said ARRL Executive Vice President David Sumner, K1ZZ.

The action followed an ARRL suggestion to the FCC that the US take advantage of the CEPT Recommendation T/R 61-01 arrangements and issue a CEPT license that would be recognized by other participating administrations and valid for visits. Last fall, the FCC proposed amending the Amateur Radio rules to make it easier for hams holding a CEPT license or an International Amateur Radio Permit (IARP) to operate during short visits to the US.



A well-equipped station with rooftop antenna was available at the hotel for the use of conferees. Here, visiting Deutscher Amateur Radio Club President Karl Vögele, DK9HU, takes his turn at the controls of BT11ARU.



No conference would be complete without tokens of appreciation for the hosts. CRSA President Xu Zengwu accepted a plaque from the League's President Rod Stafford, KB6ZV.



"What grid square did he say he was in?" David Wardlaw, VK3ADW, and Steve Mendelsohn, W2ML, monitor two-meter action from the Great Wall.

Introducing...The Regulatory Information Branch Web Page!

It's easy to access the Regulatory Information Branch Web page. Go to the ARRL Web site at <http://www.arrl.org> and click on **Regulatory**. By the way, if you haven't yet explored the main ARRL Web page, *do it!* A tremendous amount of information exists on just about every aspect of Amateur Radio. If you're new to computers and if this alphabet soup of computer terms leaves you confused, take a look at the article by Steve Ford, WB8IMY, titled "Surf the Ham Webs!" It can be found on page 62 of the February 1996 *QST*.

The RIB Web page is packed with information. Under the heading of **ARRL Regulatory Information Branch Functions, Services and Handouts**, information on most of the duties of the Regulatory Information Branch can be found.

Do you need an FCC Form 610 to change the mailing address on your amateur license? Click on **FCC forms and assistance**. You can print an FCC Form 610 and several other amateur forms.

By clicking on **Covenant & deed restrictions packages**, you discover the rich body of information available on this topic. A "covenant package" can be obtained from ARRL HQ at no cost to ARRL members.

Does your town have an overly restrictive ordinance? Click on **PRB-1**, the FCC's limited preemption of local ordinances. PRB-1 is not a cure-all and local governments can still zone to protect their citizens in matters relating to safety, health and height. The PRB-1 package is more detailed and it is available from ARRL HQ for amateurs faced with such problems. The charge for members is \$10 (\$15 for non-members). *Remember that PRB-1 specifically excludes covenants from its jurisdiction.*

There are no lawyers in the Regulatory Information Branch, so legal advice can't be given. The role of the ARRL is to provide general guidance and to point amateurs toward an appropriate source of help. For legal advice, amateurs may contact ARRL Volunteer Counsel members. VCs are hams who are also lawyers. For specific information, click on the **Volunteer Counsel Program** and for the names of VCs, click on **Referral**. The Volunteer Consulting Engineer Program is styled after the successful VC Program.

Do you need information and applications for the ARRL Ham Radio Equipment Insurance? Click on **equipment**. How about information and an application for the ARRL Club Liability Insurance? Click

Regulatory Information Branch

- Functions, Services and Handouts
- International Operating • News and Resources
- Your Local Regulatory Environment
- ARRL Recommended Band Plans • Information
- Page author: reginfo@arrl.org
- Page last revised 10:30 AM ET 10/15/97

• Attention Attorneys and Professional Engineers: ARRL Wants You!

ARRL Regulatory Information Branch Functions, Services and Handouts:

Questions about FCC rules and regulations (Part 97).
Edits the ARRL *FCC Rule Book*.
FCC forms and assistance.
Reciprocal licensing and operating information.
Antenna-height ordinance information packages (PRB-1).
Covenant & deed restriction packages.
Local-law pre-emption assistance and information packages.
TVI, CATV and other RFI information packages.
International Travel Host Exchange.
Volunteer Counsel program and referrals.
Volunteer Consulting Engineer program and referrals.
ARRL equipment and club liability insurance programs.

on **club liability**. Eligibility for low cost insurance is a popular benefit of ARRL membership.

You can order a copy of *The FCC Rule Book: Complete Guide to the FCC Regulations Governing Amateur Radio* by clicking on **The FCC Rule Book**. Published by ARRL, it is updated frequently and contains over 300 pages of material including a current copy of Part 97. We frequently hear from amateurs who quote old rules because they don't own a current copy of *The FCC Rule Book*!

There's also information under the heading of **International Operating**.

If you're going to a foreign country and you want to operate your amateur station, you are required to obtain a reciprocal permit and to pay a licensing fee in all countries of the world except Canada and New Zealand (VHF/UHF only). Complete reciprocal licensing information, including forms, is available on the RIB Web page by clicking on **Reciprocal licensing and operating information**. The US has applied for participation in the CEPT arrangement. Once the US is accepted, it will be easier for American amateurs to operate in Europe. The US is already part of a similar arrangement with some countries in North and South America that will take effect when the FCC completes rulemaking.

Need to know if you can allow your non-ham friend to participate in a conversation with a foreign ham? Click on **third-party agreements**.

Under the heading of **US Regulatory News and Resources**, amateurs can find information dealing specifically with Part 97 of the FCC Rules.

Do you have a question about the Part 97 business rules? Click on **New FCC rules Part 97.113**. This section should be used in conjunction with *The FCC Rule Book* since the interpretation material is quite helpful in understanding these rules. Click on **Amateur Frequency Allocations** for a look at amateur frequencies broken down by band, class and mode. More detailed information can be found in *The FCC Rule Book* and *The ARRL Operating Manual*. Find out details on filing formal comments in an FCC proceeding by clicking on **How to submit comments**. The RIB Web page also contains a current copy of Part 97. Click on **Part 97 - Amateur Radio Service**.

About Your Local Regulatory Environment is the heading under which amateurs can find detailed information on PRB-1, the VC and VCE Programs. There's even a list of ham radio license plate fees by state.

Last, if after examining the RIB Web page your question remains unanswered, contact the Branch staff by clicking on the appropriate staff e-mail address. Is there something you think should be included on the RIB Web page, but isn't? Contact Tom Hogerty, KC1J at thogerty@arrl.org. We welcome your suggestions.

1997 AMSAT-NA Space Symposium

I'm typing these words on a laptop as AMTRAK/VIA train number 64 rolls through the Ontario countryside, heading back to the States and home. I want to transcribe my reporter's shorthand notes while the 1997 AMSAT-NA Space Symposium is still fresh in my memory.

Toronto was a delight, as Toronto always is. It's probably one of the cleanest, safest cities in North America. Among its surrounding suburbs you'll find Etobicoke. That's the home of the Delta Hotel where more than 200 satellite enthusiasts converged for three days of education, fellowship and fun.

Something for Everyone

Several forums were devoted to beginners and beginner satellites. Laura Halliday, VE7LDH, did her best to destroy the myth of "difficult" microwave technology. Ed Krome, K9EK, did much the same, offering practical information for microwave Phase 3D ground stations.

The symposium also saw proposals for new satellites. Fred Winter, N2XOU, and Ken Ernandes, N2WWD, discussed their ideas for a new EasySat. Phil Chien, KC4YER, presented his concept of Phase 4 *LITE*, a kind of "drifting" geosynchronous bird.

Other interesting seminars included:

- A simple BPSK software modem by Doug Quagliana, KA2UPW. Thanks to Doug's work, we may soon be able to access the 1200-baud PACSATs without expensive stand-alone PSK TNCs. A PC and a sound card are all you'd need.

- Digital voice modulation for future ham satellites by Dan Schultz, N8FGV.

- Amateur Radio aboard the International Space Station by Frank Bauer, KA3HDO, and Will Marchant, KC6ROL.

Whither Phase 3D?

There was little new to report on the progress of Phase 3D. The integration teams are continuing their work and AMSAT is still looking for a ride to orbit. Bdale Garbee, N3EUA, reported that the RUDAK package was in Orlando and ready to fly. "If Phase 3D flew next week, we'd have RUDAK ready with BBS functionality at 9600 baud similar to what we have now with OSCARS 22, 23 and 25."

Of course, there was plenty of speculation at the symposium about when (and how) Phase 3D would reach orbit. Everyone will be watching the flight of Ariane 502, which may take place before this is-



Breaks between seminars provide opportunities to chat and check out the exhibits.



Dr Paul Shuch, N6TX, and his homebrew SETI receiver.



Ed Krome, K9EK, describes practical, easy-to-build microwave ground stations.

sue goes to press. Not only will fingers be crossed for a successful launch, there will be keen interest in the payload data. It will give the Phase 3D engineers a complete picture of the forces their satellite is likely to encounter—if it rides on an Ariane 5.

The launch delays have been costly. As AMSAT-NA Executive Vice President Keith Baker, KB1SF, pointed out, the AMSAT-NA Phase 3D fund has been *depleted*. The organization is now dipping into its general funds to support the project. Just as no one knows when the

satellite will fly, no one knows the final price tag. "The launch campaign itself is expected to cost in the neighborhood of \$100,000," Keith said.

All AMSAT organizations are looking for new sources of money, and issuing more appeals for assistance from the ham community. AMSAT-UK, for example, is offering to engrave your name on yet another plaque that will be placed aboard Phase 3D—for about \$280. AMSAT-NA has been dedicating portions of the spacecraft, including solar panels, to high-rolling contributors.

QST

Survey Favors APRS Move

In September *QST*, I discussed the "hot potato of the day," ie, moving all US APRS activity to 144.39 MHz in deference to Earth-to-spacecraft Amateur Radio communication on 145.80 MHz. I discussed the pros and cons of such a move and asked for your opinion as a survey.

I received 229 responses and you voted nearly 2 to 1 in favor of moving APRS to 144.39. The actual results were 147 (64%) in favor of the move to 144.39 and 82 (36%) against the move.

Approximately one third of the respondents were APRS digipeater owners/operators and they voted against the move, but by a very slim margin of one vote: 42 (51%) digipeater owners/operators voted against the move and 41 (49%) voted in favor of the move.

On the other hand, 146 of the respondents were not APRS digipeater owners/operators and they voted overwhelmingly in favor of the move: 106 (73%) in favor and 40 (27%) against.

Here's an interesting aside: 217 responses arrived by e-mail, 6 by postal mail and I collected 6 in person at the ARRL National Convention in Jacksonville. This is in stark contrast to the last time I conducted a survey in a *QST* column, when nearly 100% of the responses arrived by postal mail!

So, where do we go from here?

Compromise Proposed

At the recent Digital Communications Conference (DCC), Frank Bauer, KA3HDO, AMSAT-NA Vice President of Manned Space Operations, presented a paper that discussed why manned space ham operation is important, why they need a single frequency and why 145.80 MHz was the only choice left to them. He closed by suggesting a compromise, but provided no specific offers.

I'll let Steve Dimse, K4HG, the coordinator of the DCC APRS Seminar, pick up the story from here:

"I thought about Frank's presentation for a while, and decided to see how serious he and AMSAT-NA were about a compromise. I looked at the old APRSSIG messages talking about a move, compiled the objections, and proposed a compromise. I was pleas-

antly surprised: Frank upped the ante and proposed an APRS/Manned Space Alliance. I'll list the objections below and how we addressed them."

"I want it to be clear I do not feel that I am 'negotiating' on behalf of all APRS users. I have made it clear to Frank that APRS has no single spokesman and APRS functions as a controlled anarchy more than anything else. Likewise, this offer has not been approved by AMSAT, TAPR or ARRL. I am making a proposal to APRS users, hoping to foster discussion and reach a consensus. No deal has been struck, nothing is written in stone."

Objections

1. APRS was there first.

"True enough and there is no way to compromise this. APRS moves; no halfway solution is possible."

2. MIR is dying, why bother?

"This is not about MIR, it is about the International Space Station (ISS), which hopefully begins construction next year. It was announced at the DCC APRS Seminar that Amateur Radio has been officially manifested by NASA for ISS."

3. APRS has not been welcomed on the space assets and is considered a second class citizen.

"This is not really true. Yes, APRS users were told to stay away from MIR, but MIR is not run by AMSAT-NA. On the other hand, SPRE and STS-72 were experiments where APRS was specifically encouraged. In any case, to allay fears, we will ask AMSAT-NA, TAPR and ARRL to officially support any agreement we reach and to acknowledge that both APRS and manned space operations are vital and exciting modes that provide benefits to ham radio in general and the public at large. Furthermore, I asked for a guarantee of APRS experimentation and operation on future digital satellites, Phase 3D and ISS. Frank personally guaranteed that APRS will be permitted and he will work to get AMSAT-NA to commit to the same on other hardware, but of course, that is not within his personal purview."

4. Why should I pay to move my APRS digipeater?

"True enough. For most of us, the move will simply require turning the frequency dial. However, the cost of moving will be borne disproportionately by digipeater owners who may have to replace not just crystals, but cavities, antennas and radios

as well, since many use commercial equipment that may not be tunable to 144.39 MHz. I proposed an APRS-QSY fund, most likely administered by TAPR, that will reimburse digipeater owners for their expense. I pledged \$300 to the fund and challenged Frank to match me, which he did. We will solicit funds from the AMSAT-NA and TAPR membership, as well as the general APRS and ham communities. Commercial entities will also be approached, both for cash and discounts on equipment. The details of this system are many and will be worked out before we proceed."

5. I don't want to go through the process of coordinating another frequency.

"How many people are on 144.39 MHz? No one knows, but likely not many. Until recently, it was identified in some band plans as a "future OSCAR" subband. If there are any local users, perhaps they can be advised of the situation and the need for us to move—maybe they can be included in the reimbursement program. Also, while re-reading the FCC Rules, I discovered that simplex operations do not require frequency coordination. If you have a coordinating body that handles digital simplex systems, work with them, but most of us can just get on the new frequency."

"Let's hear your comments and suggestions. Please try to be constructive."

"Listen on 144.39. If you hear nothing, put up a beacon explaining our plans. Besides establishing our use of the channel, it will draw out any other users of the channel so we can talk with them."

"If you have a digipeater that requires money for the move, figure out what you need and what it will cost. We plan to set up a database on the Internet for dissemination of this information."

"I think this is a great opportunity for APRS to gain visibility and respectability, not to mention a true nationwide channel, which we can share with Canada. It also has the potential to make us look very selfish if we don't compromise. Please think about this seriously. If you don't like it, try to come up with constructive alternatives."—Steve Dimse, K4HG, e-mail k4hg@tapr.org

QST



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e-mail stanzepa@nai.net
URL <http://www.tapr.org/~wa1lou>

Thirty Years of CLARA

YLS all over the world are preparing to celebrate the holidays, but they're way behind CLARA. The ladies of Canada got a head start with a New Year's Eve celebration at their 30th anniversary convention September 26-28.

The Canadian Ladies Amateur Radio Association (CLARA) convention was held at the Howard Johnson Plaza Hotel in Aurora, Ontario, northeast of downtown Toronto. My first chance to meet the convention-goers was at breakfast Saturday morning. Arriving a few minutes late, I found most of the tables were already full! Glancing around the room I didn't see any faces or calls I recognized and I ended up sitting at an empty table on the other side of the room. To break the ice, one of the YLS came around with a sheet of 33 questions (of course!) for each person at breakfast.

They started with "Meet Someone Who" and ranged from "has been on a DXpedition," "took part in Field Day" to "has been a net control station." You were encouraged to have someone fill in his or her call sign in answer to each question. Everyone went from table to table introducing themselves and finding out more about each other in order to fill in the blanks. Those who were able to fill in a "rare" category were very popular! It's something you may want to use at your next club function to encourage socializing.

YLS from Italy, Norway, Japan, Australia, New Zealand, Sweden, the United States and Canada enjoyed the many organized activities and forums. Many went on a trip to the Fred Hammond Radio Museum and operated the station there. Others went on an antique steam train ride where even the engineer and conductor were hams. At every event there were drawings for prizes donated by CLARA members and friends.

The YLS exchanged tokens of friendship, a YL convention tradition. These included hand-made crochet items (teddy bears, potholders), exotic hand-painted "eyelash" QSLs and pins (a convention favorite). Above all, they shared their ideas, concerns and personal experiences in Amateur Radio.

One of the many fun events of the convention was a CW contest. It was won by Elizabeth Anderson, VE7YL, who was able to answer questions sent at 50 WPM. She said she could have copied 60 WPM, but the testers didn't have anything faster!



A CLARA group photo, taken Sunday morning, September 28, after our farewell breakfast at the Howard Johnson Plaza Hotel in Aurora, Ontario, Canada.

The GOTA Forum

A forum about the GOTA (Girl Guides on the Air) program was presented by Helen Archibald, VE2YAK. GOTA is similar to the American Scout Jamboree on the Air. Helen said last year there were over 6000 patches sent out for participation in GOTA! Station operators and Girls Guides are eligible to receive an embroidered patch.

GOTA will be held February 21 and 22, 1998. It's always held the closest weekend to February 22, which is Thinking Day in Canada. The GOTA stations use the special suffix GGC (except in the VE3 area where it's VE3GGQ). Since most of the GOTA operating frequencies were outside the US band, the YLS at the CLARA convention decided on 14.288 MHz as a frequency for YLS outside Canada to contact GOTA stations. It would be nice to have a good showing of YLS, so mark your calendars for this event!

For more information you can go to the GOTA Web site at <http://www.guidezone.sk1.com/gota.htm>, or the Girl Guides of Canada Web page at <http://www.girlguides.ca>.

Trilliums Close their Books

The CLARA convention was bitter-sweet for the Ontario Trilliums, the first YL organization in Canada. In 1967 the Trilliums saw the need for a national YL organization, similar to the YLRL, and created CLARA. The new group was funded by the Trilliums and a YL group called the Maritime Sparkettes. They created an emblem for CLARA incorporating the two

major interests of the YLS involved—CW and gardening (hence the Morse code key and flower pot in their logo).

CLARA flourished and became the national YL voice the founders had envisioned. Seeing no further need for parallel organizations, the Ontario Trilliums decided to officially close their books. Thelma, VE3CLT, presented the Trilliums' archives and remaining funds to CLARA president Renee Devenny, VA3EZ, at the CLARA business meeting Saturday. Renee is one of the new generation of YL hams who have stepped into a leadership role in a national YL organization.

Kudos to All

Proclamations from the Prime Minister, Mayor and other officials congratulated CLARA on its 30 years of contributions to Amateur Radio. These were obtained by Cathy Hrischenko, VE3GJH, the event coordinator and spark of this gala. Cathy, a founding member of CLARA, was its president in 1973-74 and 1993-94. She also writes a regular YL column for the country's national ham magazine *The Canadian Amateur*. In addition to organizing the event, Cathy created imaginative favors and decorations for the convention. One of the most intricate was a handmade Ukrainian Easter egg presented to each YL at the "New Year's Eve" banquet on Saturday night. A troupe of Ukrainian dancers and a DJ added to the celebration. Congratulations to CLARA for a wonderful event!

Happy Holidays to all!

33, Diane, K2DO

QST

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Hamfest Calendar

Edited by **Gail Iannone** • Convention Program Manager

Attention: The deadline for receipt of items for this column is the **1st of the second month preceding publication date**. For example, your information must arrive at HQ by **December 1** to be listed in the **February** issue. Hamfest information is accurate as of our deadline; contact sponsor for possible late changes. For those who send in items for Hamfest Calendar and Coming Conventions: Postal regulations prohibit mention in *QST* of prizes or any kind of games of chance such as raffles or bingo.

(Abbreviations: *Spr* = Sponsor, *TI* = Talk-in frequency, *Adm* = Admission.)

California (Livermore)—Dec 7. Noel Anklam, KC6QZK, 510-447-3857.

†Florida (Fort Myers)—Jan 3-4; Saturday 9 AM to 4 PM, Sunday 9 AM to 2 PM. *Spr:* Fort Myers ARC. Shady Oaks Community Center, Exit 25 off I-75, go W and take right onto Terry St, Rte 80. Vendors, dealers, tailgating, free parking, refreshments. *TI:* 147.345. *Adm:* advance \$4, door \$5. Colleen Sammons, KQ4TR, 3667 Kelly St, Ft Myers, FL 33901, 941-936-1431; csammons@juno.com.

†ARRL Hamfest

†Florida (Lake City)—Dec 13; set up Friday 4-7 PM; Saturday 6-8 AM; public 8 AM to 4 PM. *Spr:* Columbia ARS. National Guard Armory, Lake Jeffrey Rd, I-75 to US 90 E. Hamfest and Computer Show, tailgating (\$6), vendors, exhibitors, test table, refreshments. *TI:* 145.49. *Adm:* advance \$4, door \$5. Tables: \$8 (8 ft, first-come, first-served basis, chairs provided). Joe Aymond, WD4EOJ, Box 1649, Lake City, FL 32056, 904-935-2405 eves; wd4eoj@isgroup.net.

†Florida (Okeechobee)—Dec 6, 8 AM to 4 PM. *Spr:* Okeechobee ARC. AG Center, Rte 441, N of Rte 70. ARRL info booth, VE sessions. *TI:* 147.195 (100 Hz). *Adm:* advance \$4, door \$5. Al Berryman, AD4RZ, 3037 SE 21st Ct, Okeechobee, FL 34974, 941-467-0516; ad4rz@juno.com.

Indiana (Evansville)—Nov 29. Neil Rapp, WB9VPG, 812-479-5741.

†Indiana (South Bend)—Jan 4, 8 AM to 3 PM. *Spr:* Michiana Valley Hamfest Assn. Century Center, US 31-33 Business, N at Jefferson. *TI:* 145.29. *Adm:* advance \$4, door \$5. Bob Denniston, KA9WNR, 21970 Kern Rd, South Bend, IN 46614; 219-291-0252.

Minnesota (Golden Valley)—Dec 6. Chris Peterson, KG0BP, 612-520-0515.

†New York (Marathon)—Jan 10, 7 AM. *Spr:* Skyline ARC. Civic Center, Rte 81, Exit 9, follow signs. VE sessions. *TI:* 147.18. *Adm:* \$2. Barbara Mudge, KB2TIK, 3364 Rte 221 W, Marathon, NY 13803; 607-849-6751.

South Carolina (Union)—Dec 13. Roger Gregory, KD4YFB, 864-427-1462.

Tennessee (Morristown)—Jan 3. Perry Hensley, N4PH, 423-828-4848.

Attention All Hamfest Committees!

Get official ARRL sanction for your event and receive special benefits such as free prizes, handouts, and other support. If you are an affiliated club, you are also entitled to receive a 10% commission on sales of League publications!

It's easy to become sanctioned. Contact the Convention and Hamfest Branch at ARRL Headquarters, 225 Main St, Newington, CT 06111. Or send e-mail to giannone@arrrl.org.

QST

Coming Conventions

Edited by **Gail Iannone** • Convention Program Manager

1997

November 22-23
Florida State, Tampa*

1998

February 7-8
Florida State, Miami

February 7-8
Mississippi State, Jackson

* See November *QST* for details.

Attention Hamfest and Convention Sponsors:

ARRL HQ maintains a date register of scheduled events that may assist you in picking a suitable date for your event. You're encouraged to register your event with HQ as far in advance as your planning permits. Hamfest and convention approval procedures for ARRL sanction are separate and distinct from the date register. Registering dates with ARRL HQ doesn't constitute League sanction, nor does it guarantee there will not be a conflict with another established event in the same area.

We at ARRL HQ are not able to approve dates for sanctioned hamfests and conventions. For hamfests, this must be done by your division director. For conventions, approval must be made by your director and by the executive committee. Application forms can be obtained by writing to or calling the ARRL convention program manager, tel 860-594-0262.

Note: Sponsors of large gatherings should check with League HQ for an advisory on possible date conflicts before contracting for meeting space. Dates may be recorded at ARRL HQ for up to two years in advance.

QST

Strays

W9NN AND W9JJ

♦ Bart Jahnke, W9JJ (ex KB9NM), is one of the several Headquarters staff members who got a new call sign via vanity call sign gate 2. Bart recently received a package of memorabilia from Bob Baird, W9NN, who had held W9JJ as a second-station call sign back in those good old days. Here are some of the highlights:

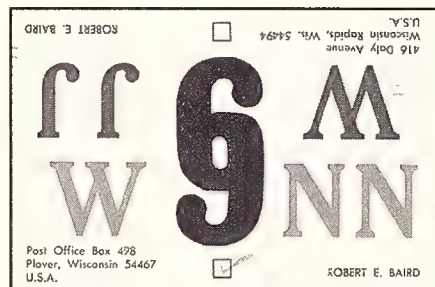
Bob sent a copy of a letter, dated June 22, 1928, from The Radio Division of the Department of Commerce that identifies the date on which the use of the "W" prefix for US ham stations began, and shows that the Morse "de" came into FCC-mandated use at the same time. The letter says:

"You are herewith advised that amateur call letters are now being assigned preceded by the letter 'W'. ... It has been decided that 'W' will precede all amateur calls for stations within the Continental limits of the United States and the letter 'K' shall precede all such calls for stations in the insular possessions and Alaska.

"The use of the 'W' before your regular call letters, however, is not to begin until October 1, 1928, after which time [it] should be used for all transmissions.

"Amateur station licenses already issued will require no change or amendment. After October 1, 1928, however, all Continental United States amateur stations will make use of the prefix 'W' for both foreign and domestic communications. Example: Whereas, the present practice in calling is, 'nu 6AA 6AA 6AA nu 8AA 8AA 8AA', after October 1, 1928 it will be, 'W6AA W6AA W6AA de W8AA W8AA W8AA'.

"Respectfully, S. W. EDWARDS, U. S. Supervisor of Radio."



It's W9JJ or W9NN, depending on how you look at it!

Bob also sent a photocopy of his "License to Radio Operator, Amateur Extra First Class" (number 2809) dated January 25, 1932, a wonderfully ornate certificate. Bob commented that when the FCC took over the radio regulation business in 1932, they canceled all the Amateur Extra First Class licenses. He and others holding that class license were so annoyed that they didn't take the Amateur Extra class exam when it was introduced in 1953. Bob finally took the exam last summer at the urging of fellow club members. Bob's comments about the two exams, which he took 64 years apart, were that "The 'first one' without books was rough—the current one is a 'memory test'."

He also sent a copy of a photo taken November 2, 1922, of spark station 8AIB, a collaborative effort of four friends—Chas Fertick, W8AIB; Clinton Petry, 8AWN; Allen Apple, 8CNL (later K4ILX); and Bob himself. The station's best spark DX was a contact with a United Fruit banana boat off the coast of Brazil in late 1921, radio call sign DZ. In 1952, Bob worked VP1AA in Belize and learned that he had been the ship's operator at DZ for that contact. Bob says he would love to hear from other old timers who operated spark, to trade tales of the old days.

Silent Keys

By Kathy Capodicasa, N1GZO

It is with deep regret that we record the passing of these amateurs:

W1CEQ, Danforth M. Googins, Kennebunk, ME
 *W1FB, Doug DeMaw, Luther, MI
 W1FCO, John H. Bergstedt, Groton, CT
 AF1G, Joseph J. Mayer, Alna, ME
 WA1ITZ, Justin C. Barton, Randolph, VT
 NU1J, Stanley C. Aldrich, Rochester, NH
 W1LNI, Russell H. Lowd, Portland, ME
 K1PXF, Louis B. Rollins, South Portland, ME
 N1QWY, Emma T. Parker, Menemsha, MA
 *W1SP, C. V. Anderson, Terryville, CT
 W1TRE, Barbara A. Harrington, Malden, NH
 W1UFR, Joseph A. Condi, Pittsfield, MA
 K1VKT, Frank McNamara, Lowell, MA
 K1ZUP, J. H. Sleeper, Wakefield, MA
 WB2AIW, Robert W. Steele, Lockport, NY
 W2DYR, Eric W. Cruser, Lakehurst, NJ
 N2FEQ, Edwin C. Brummer, Mahopac, NY
 WB2IOI, Erwin H. Berg, Margate City, NJ
 KF2JW, Stanley M. Hoffman, Staten Island, NY
 K2JWT, Walter A. Mordes, East Northport, NY
 WB2OVO, Jerome Wayne, Fayetteville, NY
 N2QVM, Barbara Grebenstein, Convent Station, NJ
 N2RDO, John A. Burton, Bridgewater, NJ
 K2VVI, George Rosien, Bergenfield, NJ
 N2XYX, Clemens C. Ray, Binghamton, NY
 W2YL, Joel J. Young, Elmira, NY
 KA3ATQ, John J. Kirby, Pittsburgh, PA
 W3CAU, Karl M. Wiegandt, Allentown, PA
 K3ETS, W. D. Zeares, Dallas, TX
 N3IYC, Wallace Bailey, Beltsville, MD
 W3JZP, Elliott H. Glunt, Silver Spring, MD
 N3LCL, Charles R. Gross, Norwood, PA
 AA3MA, Oliver R. Ellis, Oxon Hill, MD
 K3OKL, Edward L. Hayden Jr., Annapolis, MD
 N3VRQ, Donald F. McAvoy, McKeesport, PA
 KV4AD, W. B. Fageol, St Thomas, VI
 W4AMX, Philip Konter, Savannah, GA
 W4AWS, Arthur B. Hale, Safety Harbor, FL
 KS4BM, John L. Glisson, Richmond, VA
 KK4DR, Wilmer E. Brewer Jr., Savannah, GA
 KD4FKF, John Bosch, Port Richey, FL
 N4FLW, Irving Strobbe, Butner, NC
 W4GDQ, Alvin F. Badgett, Decatur, GA
 K4GRH, Walter J. Parker Sr., Jensen Beach, FL
 N4GSS, Eugene D. Bench, Fort Walton Beach, FL
 WA4HEJ, O. T. Keeling Jr., La Vergne, TN

K4HVL, C. C. Fuller, Old Hickory, TN
 W4IFN, Warren Snyder, Milan, TN
 KE4KNG, Jack A. Hunter, Jacksonville, NC
 N4LLC, Lawrence E. Elbrecht Sr, Port Saint Lucie, FL
 W4MBA, Robert M. Avery, Scottsdale, AZ
 W4MBR, James H. Ellis, Vero Beach, FL
 N4MPH, Clyde Stansel, Vero Beach, FL
 W4MZA, John D. Rule, Merritt Island, FL
 N4PEK, Dwight L. Williamson, Falls Of Rough, KY
 W4RFX, J. W. Lunsford, Lebanon, TN
 N4RLV, Ruby M. Rankin, Asheville, NC
 K4RST, Judson V. Arthur, Montgomery, AL
 K4SXM, Idee Johnson Sr, Virginia Beach, VA
 WB4TJJ, Edward E. Nicholas Jr, Lancaster, VA
 KD4TPY, William R. Quinn Jr, Dalton, GA
 K4UHW, Stacey M. Mills, Charlottesville, VA
 K14UP, Gerald M. Hay, Raleigh, NC
 W4ZQJ, Frederick E. Rossnagel, Prattville, AL
 *KU5B, Jack M. Bickham, Norman, OK
 KJ5FP, Hubert Smith Jr, Searcy, AR
 WD5GTM, Bill E. Jones, Jonesboro, AR
 AB5MP, Dale G. Johnson, Edmond, OK
 *W5OQ, Vernon L. Dillaplain, Little Rock, AR
 W5OQ, Vincent L. Irvan, Arlington, TX
 W5WPF, John Avila, San Antonio, TX
 K5WRM, Claude W. Hollen, Monahans, TX
 KA6APP, C. H. Reeks, Fresno, CA
 *AA6BB, Gerald D. Branson, Junction City, OR
 K6BWW, Robert N. Fargo, Los Banos, CA
 KC6FAW, Melvin T. Hurley, Kensington, CA
 W6GB, Alan S. Nusbaum, Sun City West, AZ
 KH6HAP, James L. Williams, Haleiwa, HI
 WB6HSP, Robert G. Robb, Anaheim, CA
 N6JGU, L. E. Whitcomb, Altus, OK
 WA6KNF, Bernard A. Sword, Weslaco, TX
 W6MU, David Muir, Stockton, CA
 KA6O, John T. McCauley, Aptos, CA
 W6RKA, Robert F. Holtz, La Jolla, CA
 W6TLW, Earl R. Boyd, Loveland, CO
 WA6TTP, Nicholas Wogh, Napa, CA
 W6VBU, Warren V. Bruner, Carmichael, CA
 KC7AHL, Tino Venzon, Sparks, NV
 W7CHW, Ernest E. Campbell, Seattle, WA
 K7COM, James P. Downward, Salt Lake City, UT
 KC7CWN, Charles R. Keeney, Central Point, OR
 AA7IV, Barbara A. Oppenheimer, Seattle, WA
 W7MNA, Wilbur Kent, La Conner, WA
 K7OAX, Carl Wyatt, Tempe, AZ
 WA7SKJ, William F. Nibour, Phoenix, AZ
 *N8CIU, Harry F. Fritchen, Mansfield, OH
 AA8ED, Edward L. Clark, Zanesville, OH
 W8EYH, R. C. Miley, Zephyrhills, FL
 *W8GBR, Larry R. Baine, Lake Odessa, MI
 W8GCZ, Emory J. Reaser, Princeton, WV
 *AB8P, Allan Severson, North Olmsted, OH
 K8MGN, Raymond E. Houser, Wooster, OH

K8RIF, Charles F. Stevens, Lakeland, FL
 W8RLR, Glenn Mast, Wooster, OH
 W8SSZ, Kenneth W. Huggett, North Caldwell, NJ
 K8UKM, Elizabeth M. Isham, Columbus, OH
 W8ZCK, William T. Price, Westerville, OH
 W9BCP, Casimir A. Pazer, Chicago, IL
 KB9CLN, Howard F. Richmond, Rock Falls, IL
 W9ECS, Willis A. Blaisdell, Freeport, IL
 AA9GJ, Donna C. Shinabarger, Daleville, IN
 KB9HBR, William B. Brown, Edwardsville, IL
 W9HCU, Clarence W. Equit, Lodi, CA
 K9HPT, Lars B. Hallberg, Minocqua, WI
 N9ICE, Jack F. Palladay, Indianapolis, IN
 *W9KJF, Gene Van Sickle, Indianapolis, IN
 W9QLG, Arthur G. Leitner, Tell City, IN
 *KC9RC, Gerald A. Fox, Mahomet, IL
 N9VCY, Michael D. Owens, Belleville, IL
 WA9WKH, Daniel F. Rubinas, Brooksville, FL
 *W9WYN, Jack O. Miller, Brookfield, IL
 N9ZFB, Glen M. Fletcher, Sharpsville, IN
 KO0A, Raymond C. Richardson, Lyons, KS
 N0AZW, Marvin E. Nebel, Jefferson City, MO
 *N0AZY, James E. Neely, Springfield, MO
 KA0CPS, Richard H. Kouns, Pueblo, CO
 W0CSO, Charles Hildebrand, Shawnee, KS
 K0CXJ, Jon L. Lunder, Detroit Lakes, MN
 *WD0EMQ, John E. Tipton, Rapid City, SD
 WA0IOK, Kenneth B. Barclay, Sun City West, AZ
 N0JAS, Michael P. Miller, Des Moines, IA
 K0KDX, Floyd L. Finley, Topeka, KS
 W0ME, Maurice T. Baer, Salina, KS
 W0OEX, Elmer L. Castrodale, Mount Pleasant, IA
 NR0Z, Donna M. Parrill, South Sioux City, NE
 G2GV, H. A. Moston, Van Nuys, CA
 VK4IT, R. A. Wilson, Northgate, Australia

*Life Member, ARRL

Note: Silent Key reports must confirm the death by one of the following means: a letter or note from a family member, a copy of a newspaper obituary notice, a copy of the death certificate, or a letter from the family lawyer or the executor. Please be sure to include the amateur's name, address and call sign. Allow several months for the listing to appear in this column.

Many hams remember a Silent Key with a memorial contribution to the ARRL Foundation. If you wish to make a contribution in a friend or relative's memory, you can designate it for an existing youth scholarship, the Jesse A. Bieberman Meritorious Membership Fund, the Victor C. Clark Youth Incentive Program Fund, or the General Fund. Contributions to the Foundation are tax-deductible to the extent permitted under current tax law. Our address is: The ARRL Foundation Inc, 225 Main St, Newington, CT 06111.

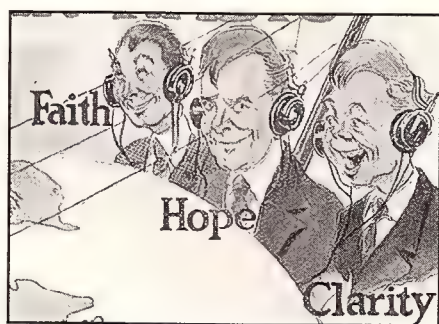
QST

30 Years Ago

December 1922

◆ Clyde Darr, 8ZZ, presents the cover once again, showing hams at the ready—"Transatlantic Tests QRV," with several European countries ready to give a try with the North American hams. The editorial addresses the upcoming tests, which will take place "but a few days [after] this issue of QST reaches our readers."

The lead article, "QRV for the Tests?" further fans the enthusiasm of the moment, as does the following article by Traffic Manager F. H. Schnell, "The Transatlantic Finals" (the latter explains, among other topics, how to convert between G.M.T. and your local time). Paul Godley, 2ZE, tells how to hear signals from across the ocean in "Listening for Europe." C. R. Leutz presents his "Notes on a Super-Heterodyne," with discussion of the advantages of superhet receivers and how to build them. "Some More Records" tells that "6XAD, the experimental station of Major Lawrence Mott...at Avalon, Catalina Island, Calif., [has] been heard...in Australasia." Tests are being set up for the coming winter. The article reports that, "to the best of our belief this is the world's amateur long-distance transmission record." Howard Mason, 7BK, tells about "The Radio Lizz" ("Lizz" comes from the Model A Ford being called the "Tin Lizzie"), wherein he has installed a radio receiver in his au-



"Three Wise Men" for the upcoming transatlantic tests on the cover of QST, December of 1922.

tomobile, using a three-tube design and a big loop that runs front to back along his car's full length.

December 1947

◆ The cover shows a young ham using a homebrew receiver with a built-in code oscillator for practice, which is featured in the article "Building a Code-Practice Receiver," by Richard Smith, W1FTX. The editorial discusses the current shortage of spectrum space, with the opening sentence, "The radio world most desperately needs more spectrum space"—a perennial problem.

Kenneth Norton discusses "Sunspots and Very-

High-Frequency Radio Transmission." Phil Rand, W1DBM, tells about "The Q5-er," an outboard circuit to perform a second conversion from a receiver's IF to a second IF at a lower frequency, where selectivity can be improved dramatically. Cal Hadlock, W1CTW, tells how to convert 144 Mc. gear to 235 Mc. in "Let's Start Right on 1 1/4!" Katashi Nose, KH6IJ, ex-K6CGK, tells about "A 40-Pound 14-Mc. Four-Element Beam." "Winds, Waves and Snakes," by National Emergency Coordinator Albert Hayes, W1IN, reports on amateur participation in the September 1947 Florida peninsula-Gulf Coast hurricane.

December 1972

◆ The cover shows the Oscar 6 ham satellite in W3GEY's backyard, as it is being tested in the sunlight for the first time. The editorial discusses FCC Docket 19245, "the so-called Eyebank matter," which clarifies the rules regarding hams' handling of traffic for third parties. The Docket was discussed further in "Happenings of the Month."

Jon Hagen, W7URZ/KP4DNH, describes "A Simple Frequency Counter for Receivers." Lew McCoy, W1ICP, writes about "Operating Hints for the Novice." Robert Glorioso, W1EBW, speaks of "New Life for the Heath VF-1 VFO," converting it to solid-state operation. Part 1 of "ATV with the Motorola T 44 UHF Transmitter," by F. R. McLeod, W0MZL/9, stirs up interest in the young field of ATV. HQ's Doug DeMaw, W1CER, presents "Notes on Custom-Built Repeater Gear." An article by HQ staffers discusses the addition of "A Daylight National Traffic System" to augment the existing nighttime NTS.—Al Brogdon, W1AB

QST

Contest Corral

Edited by Bev Fernandez, N1NAV • Assistant Contest Manager

Happy Holidays to all! December is here and so are two great contests: the 160 and 10-meter competitions. With winter weather creeping in, it's a great time to keep warm by the radio. Don't miss these two great contests!

And don't forget: Send in your entries for the ARRL International EME Competition. This year we're offering EME pins for making just *one* contact. The pins are only \$5. Send for yours today.

Next month we have two popular events, the ARRL RTTY Roundup and the January VHF Sweepstakes. They're both announced in this issue.

Qualifying Runs

December W1AW Qualifying Runs are at 10 PM EST Dec 1, and at 9 PM EST Dec 16. The West Coast Run will be at 9 PM PST Dec 3. See the W1AW Schedule in this issue for details.

December 5-7

ARRL 160-Meter Contest—See November *QST*, p 107.

7-8

QRP ARCI Holiday Spirits Homebrew Sprint, CW, sponsored by QRP ARCI, 2000-2400Z December 7. CW only. Single band, all band, high band (20, 15, 10, 6 meters) or low band (160, 80, and 40 meters). Work stations once per band. Exchange RST, state/province/DXCC country, and QRP ARCI number if member (nonmembers send power output). 1.810 3.560 3.710 7.040 7.110 14.060 21.060 21.110 28.060 28.110 50.060. Score 5 pts/QSO with ARCI member, 2 pts/QSO w/nonmembers in the same continent and 4 pts/QSO with nonmembers in different continents. Bonus points: add 2000 pts/band for each HB XMTR, 3000 pts/band for each HB RCVR, and 5000 pts/band for each HB XCVR used. Final score is QSO points × states/provinces/DXCC countries worked per band × power multiplier (>5 W, ×1; <5 W, ×7; <1 W, ×10; <250 mW, ×15), plus bonus points. Send entries by January 2 to QRP ARCI Contest Manager, Cam Hartford, N6GA, 1959 Bridgeport Ave, Claremont CA 91711, or e-mail them to CamQRP@cyberg8t.com. See the QRP ARCI Web site at <http://rtpnet.org/~qrp/>.

TOPS Activity 3.5 MHz CW Contest, 1800Z Dec 6 until 1800Z Dec 7. 80 meters only, 3.510-3.560. Single operator, Single operator QRP (<5 W),

multioperator. Exchange RST and serial number; TOPS members also give membership number. Score 1 pt/QSO w/own country (W/VE/VK/PY/JA/U call areas count as separate countries); 2 pts/QSO w/other countries in the same continent, 6 pts/QSO w/other continents or MM stations. Add 2 bonus pts/QSO w/TOPS member; 6 pts/QSO between TOPS members; and 10 pts/QSO w/GB6AQ. Multipliers are prefixes. Final score is QSO points + bonus points × multipliers. Awards. Send logs by Jan 31 to Helmut Klein, OE1TKW, Nausegasse 24/26, A-1160 Wien, Austria.

13-14

ARRL 10-Meter Contest, see November *QST*, p 108.

20-21

Croatian CW Contest, sponsored by Hrvatski Radioamaterski Savez, 1400 UTC Dec 20 to 1400 UTC Dec 21. CW only. Categories, single operator, multioperator and SWL. Exchange is RST + ITU zone. Points, 10 pts with contacts with 9A stations on 1.8/3.5/7MHz, 6 points on 14/21/28MHz, 6 points with other continent on 1.8/3.5/7MHz, 3 points on 14/21/28MHz, 2 points with own continent on 1.8/3.5/7MHz, 1 point on 14/21/28MHz. Multipliers, DXCC countries plus WAE list on each band 1 point. Final score sum of QSO points from all bands multiplied with sum of multipliers from all bands. Certificates will be awarded. Mail logs within 30 days to Hrvatski Radioamaterski Savez, Croatian CW Contest, Dalmatinska 12, 10000 Zagreb, Croatia.

27-28

Stew Perry Topband Distance Challenge, 1500Z Dec 27 until 1500Z Dec 28. 160 meters, CW only. Single operator, multioperator, single transmitter. Exchange grid square, RST (optional). QSO points equal the distance between contacts in km. Count additional point for every 500 km QSO. Final score is QSO points × power multiplier (>100 W, ×1; <100 W, ×2; <5 W, ×4). Awards. Send log by Jan 28 to Boring ARC, 15125 SE Bartell Rd, Boring, OR 97009.

RAC Winter Contest, sponsored by Radio Amateurs of Canada, 0000-2400Z Dec 28. CW and phone. Work stations once per band and mode. QSOs must be made in their respective subbands. No repeater QSOs. Single operator, Single operator QRP (maximum 5 W output) all band or single band; single operator, all band low power (100 W); multioperator. Send RS(T) and serial no. (VE stations exchange RS(T) and Province or Territory).

CW—25 kHz up from the band edges; phone—1.850 3.775 14.175 21.250 28.500. Score 2 pts/QSO outside VE; 10 pts/QSO with VE; and 10 pts/QSO with RAC official stations using "RAC" suffix (ie, VE2RAC, VE6RAC, VY2RAC, etc.). Multipliers are Canadian provinces and territories (maximum 12) per mode per band. Final score is QSO pts × multipliers. Awards. Send logs by Jan 31 to RAC Contest Committee, 720 Belfast Rd, #217, Ottawa ON K1G 0Z5, Canada. See the Winter Contest site at <http://www.rac.ca/CANWIN.htm>.

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ARRL Straight Key Night, 24-hour period UTC (from 7 PM EDT Dec 31 until 7 PM EST Jan 1). This is a friendly CW meeting on the air using straight keys. Suggested areas of operation on 80, 40, and 20 meters are 60 to 80 kHz from the lower band edges and 10 kHz from the lower Novice/Technician Plus band edges. When participating in Straight Key Night, use "SKN" instead of "RST" preceding the three-digit report to clue in passers-by. When the event is over, send a list of stations worked and your vote for best fist heard (not necessarily one you've worked) and most interesting QSO during that period. This is not a contest; quick and contest-like exchanges are discouraged. Mail your report by January 10 to ARRL Headquarters.

January Events

3-4	RTTY Roundup
3-4	Northern New York Section QSO Party
10-11	Hunting Lions in the Air Contest
17-19	ARRL January VHF Sweepstakes
24-26	CQ WW 160-Meter DX Contest, CW
31- Feb 1	YL International CW QSO Party

Contest Announcements: Items for this column can be sent on an MS-DOS disk in ASCII format, via modem (860-594-0306), via fax (860-594-0259), via Internet (to contest@arrrl.org) or in letter form. Submissions must be received no later than the 1st of the second month preceding the publication date; ie, a contest in March would have to be received by January 1.

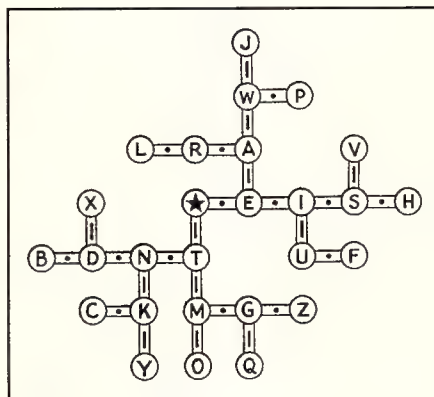
QST

Strays

BLAST FROM THE PAST

♦ Thomas Hedges, W8BKE, came up with a neat idea that was published in the February 1934 issue of *QST*, to help people learn to copy Morse code. The idea was so good that we again present it for our readers' amazement and amusement.

When starting to learn the code and working at copying perhaps 5 WPM, just place your pencil on the star at the center of the graphic shown below. When you



hear a dit, move your pencil in a horizontal direction along the lines; for a dah, move it vertically. When you have "traced" the path of all the dits and dahs of the character, your pencil will be pointing at the letter they represent. Someone who knows *nothing* about Morse code can be quickly trained to recognize the difference between a dit and a dah, and in a first session can be translating (not really "copying") at a 5 WPM rate. A few practice sessions later, he or she will be learning the individual characters because of the repetition.

Give it a try. This shows that the KISS principle really works (Keep It Simple, Stupid!).

Special Events

Edited by **Bev Fernandez, N1NAV** • Assistant Contest Manager

Bethlehem, CT: Hen House Gang AR, W1FHP, 0000Z **Dec 1** to 2400Z **Dec 31**, Christmas from Bethlehem, 7.108 7.250 14.040 14.325. QSL. Robert O'Neil, W1FHP, 283 Hard Hill Rd N, Bethlehem, CT 06751.

Iowa City, IA: ICARC and the University of Iowa ARC, W0IO, 1400Z-2300Z **Dec 6**, 150th Anniversary of Iowa University, 7.250 14.250 21.300 28.400. Certificate. ICARC, Box 0004, Iowa City, IA 52244-0004.

Baltimore, MD: Historic Electronics Museum ARC, W2W, 1500Z **Dec 6** to 2100Z **Dec 7**, Attack on Pearl Harbor, 7.245 7.115 14.245 14.045. Certificate. Historical Electronics Museum, MS 4015, W2W, Box 746, Baltimore, MD 21203.

Homestead, FL: The Everglades ARC, W4SVI, **Dec 6-7**, 50th anniversary of Everglades National Park, 7.225 14.225 21.350 28.310. Certificate. Everglades ARC, c/o Scott Buell, 15380 SW 151 Tr, Miami, FL 33196.

Mesa, AZ: EVARG, WA7USA, 1500Z **Dec 6** to 2400Z **Dec 7**, Commemoration of the USS Arizona, 14.240 21.340 2 meters. Certificate. EVARG, 3264 E Carol Ave, Mesa, AZ 85204-3245.

Bethlehem, IN: Clark County ARC, W9WWI, 1500Z **Dec 12** to 2200Z **Dec 13**, Christmas Season, 3.900 7.200 7.050. Certificate. CCARC, W9WWI, 1805 E 8th St, Jeffersonville, IN 47130.

St Johnsbury, VT: St Johnsbury Academy Wireless, KB1BPR, 1300Z-1900Z **Dec 13**, 155 years of the Academy, 7.285 14.285 28.385 28.485. Certificate. St Johnsbury Academy, Bruce Burk, 7 Main St, St Johnsbury, VT 05819.

Kenosha, WI: Lakeshore Repeater Assn, N9LTA, 1500Z-2100Z **Dec 13**, Carthage College sesquicentennial, 7.125 28.445 50.150 146.520. Certificate. Carthage College Computer Center, 2001 Alford Park Dr, Kenosha, WI 53140-1994.

Santa Claus, IN: The Legion of Indianapolis DXers, W9IND, 1500Z-2200Z **Dec 13**, and **Dec 14**, Christmas, 7.280 14.280 21.380 28.380. Certificate. Brian Smith, W9IND, 143 Tracy Ridge Blvd, New Whiteland, IN 46184.

Edgewater/New Smyrna Bch, FL: Coronado Wireless Assn ARC, KE4AG, 1400Z **Dec 13**, 2100Z **Dec 14**, 17th Annual Christmas Event, 7.250 14.250 21.325 28.325. Certificate. QSL. Donald Benham, KE4AG, 316 S Ridgewood #35, Edgewater, FL 32141.

Seneca, IL: Starved Rock RC, W9MKS, 1400Z **Dec 13** to 0400 **Dec 15**, 55th Anniversary of the first LST Launch from Seneca Prairie Shipyard, 3.555 7.055 14.055 21.355. QSL. SRRC, Box 198, Leonore, IL 61332.

Bethlehem/Nazareth, PA: Christmas City ARC/Delaware Lehigh ARC, WX3MAS, 1400Z-0200Z **Dec 13-14** and **Dec 14-15**, Annual Christmas City Event, 3.965 7.265 14.265 21.365. Certificate. DLARC, WX3MAS, RR4 Greystone Bldg, Nazareth, PA 18064-9211.

Waco, TX: Central Texas HF Society, 1600Z **Dec 13** to 2400Z **Dec 20**, 142nd anniversary, Phone and CW 40-10, 146.58. Certificate. Larry Merritt, KCSBFM, Box 3501, Waco, TX 76707.

Belen, (Bethlehem), NM: Valencia County ARA, KCSOUR, 1400Z **Dec 20** to 2359Z **Dec 28**, Christmas season from Bethlehem, NM. 75 KHz

from top of each band. QSL. VCARA, Box 268, Peralta, NM 87042.

Fullerton, CA: Fullerton RC, W6ULI, 0030Z-0700Z **Dec 31**, Nonalcoholic New Year, 7.020 14.330 21.330 28.400. Certificate. FRC, Box 545, Fullerton, CA 92836.

Rockford, IL: Rockford ARA, W9AXD, 1900Z-2300Z **Dec 31**, Rockford's New Year Celebration, 3.875 3.700 7.140 14.265. QSL. Jeffrey Anderson, 1014 Fieldcrest Dr, Rockford, IL 61108.

Certificates and QSL cards: To obtain a certificate from any of the special-event stations offering them, send your QSO information along with a 9×12-inch self-addressed, stamped envelope to address listed in the announcement. To receive a special event QSL card (when offered), be sure to include a self-addressed, stamped business envelope along with your QSL card and QSO information.

Special Events Announcements: For items to be listed in this column, you must be an Amateur Radio Club, and use the ARRL Special Events Listing Form. Copies of this form are available via Internet (info@arrl.org), the ARRL BBS (860-594-0306), or for a SASE (send to Special Requests, ARRL, 225 Main St, Newington, CT 06111, and write "Special Requests Form" in the lower left-hand corner. Entries must be received by ARRL HQ no later than the 1st of the second month preceding the publication date; ie, a special event listing for Jan QST would have to be received by Nov 1. Entries may be sent on an MS-DOS floppy disk in ASCII format; fax at 860-594-0259; via modem (860-594-0306); via Internet (to contest@arrl.org); or in letter form.

QST

New Products

LOG-PERIODIC DIPOLE ARRAY ANTENNAS FROM TENNADYNE

◊ A trio of rotatable log-periodic dipole arrays (LPDA) have been added to Tennadyne's broad line of directional antennas. The Model T8-1030 is an 8-element array that covers 10 to 30 MHz; the T6-2014—first described in December 1976 *QST*—is a 6-element Log-Yag for 20 meters (monobanders for other ham bands are available); and the T7-1830, a 7-element LPDA designed as a companion to the T6-2014, covers 18 to 30 MHz.

Prices: T8-1030, \$975; T6-2014, \$895; T7-1830, \$495. For more information, contact Tennadyne, HC 81, Box 347A, Junction, TX 76849; tel/fax 915-446-4510, e-mail tennadyne@juno.com.

VINTAGE COLLINS COLLECTOR VIDEOS FROM HI-RES

◊ Collectors should be happy to note the availability of three additions to Hi-Res

Communications' Collins Video Library. Hosted by R-390A expert Chuck Rippel, WA4HHG, the *R-390A Video* is a seven-hour seminar on every aspect of selecting, operating, maintaining and restoring this venerable receiver. The *75A-4 Video* (four hours) and the *KWS-1 Video* (two hours) cover similar topics and are hosted by Collins expert Butch Schartau, KØBS.

Prices: 390A, \$109.95; 75A-4, \$89.95, KWS-1, \$39.95. Purchase three or more videos for a 10% discount. VISA/MC accepted. For more information, contact Floyd Soo, W8RO, Hi-Res Communications, 8232 Woodview Dr, Clarkston, MI 48348; tel/fax 248-391-6660, e-mail hires@rust.net; <http://www.rust.net/~hires>.

HAM IV ROTATOR CABLE ASSEMBLIES FROM CABLE X-PERTS

◊ Designed to fit Hy-Gain HAM IV rotators, Cable X-perts' new 8-conductor rotator cable assemblies come complete with factory installed "Jones" plugs and sockets. Each termination is soldered and tested for mechanical and electrical integrity.

Prices: 125-foot assembly, \$34.95; 200-foot assembly, \$84.95. Custom lengths can be supplied. Shipping is extra. For more

information, contact Cable X-perts, 416 Diens Dr, Wheeling, IL 60090; tel 800-828-3340, fax 847-520-3444, e-mail cxp@ix.netcom.com; <http://www.cablexperts.com>.

FLEXIBLE CTCSS ENCODER/DECODER MODULE FROM HAMTRONICS

◊ The TD-5 CTCSS tone encoder/decoder module is now available with expanded instructions and application notes. The module, which can be easily adapted for use with almost any transceiver or repeater, features crystal-controlled accuracy and several tone-selection options.

Single tones can be set with a simple DIP switch. If several tone combinations are required, the supplied applications manual details how to configure a front-panel switch to choose among several tone presets. Other features include adjustable deviation, muting, and a high-pass audio filter (when used as a decoder).

Price: \$39, kit; \$59, wired and tested. For more information, contact Hamtronics, 65-Q Moul Rd, Hilton, NY 14468; tel 716-392-9430 <http://www.hamtronics.com>.

QST

General Rules for All ARRL Contests



The Rules for ARRL Contests have been reorganized. On this and following pages you'll find general rules that apply to all ARRL contests, rules for contests on bands below 30 MHz, and on bands above 50 MHz. The reorganization makes the rules consistent between contests. This results in some changes. You'll want to read this carefully, and you'll want to save this issue of *QST* for future reference.

With the general rules you'll find specific rules for Straight Key Night, January VHF Sweepstakes, RTTY Roundup, and the International DX Contest.

Rules for all 1998 ARRL contests will be available soon in the *ARRL 1998 Contest Yearbook* and on the ARRL Web site. —Chuck Hutchinson, K8CH, Membership Services Manager

1. Precedence of Rules:

1.1. Rules for individual contests or events (including Field Day) take precedence over all General Rules.

1.2. General Rules for HF and VHF contests take precedence over General Rules for all contests.

2. Conditions of Entry: Entrants agree to be bound by:

2.1. The provisions, and intent, of ARRL contest rules.

2.2. The regulations of their licensing authority.

2.3. The decisions of the ARRL Awards Committee.

3. General Rules:

3.1. All operators must observe the limitations of their operator licenses and station licenses at all times.

3.2. Call signs and exchange information must be sent, received, acknowledged, and logged correctly by each station for a complete QSO.

3.3. One operator may not use more than one call sign from any given location during the contest period.

3.4. The same station may be worked only once per band for contest credit.

3.5. A transmitter used to contact one or more stations may not be subsequently be used under any other call during the contest period, except for family stations where more than one call has been issued, and then only if the second call sign is used by a different operator. (The intent of this rule is to accommodate family members who must share a rig, and to prohibit manufactured or artificial contacts.)

3.6. All transmitters and receivers must be located within a 500-meter-diameter circle, excluding antennas.

3.6.1. This prohibits the use of remote receiving installations.

3.6.2. Exceptions:

3.6.2.1. Stations remotely controlled by radio link may use necessary equipment at the control point. This does not include using the control point as another receiving location.

3.6.2.2. Multi Operator and Single Operator Assisted stations may use spotting nets.

3.7. Cross-band contacts are not permitted.

3.8. Contacts made through repeaters, digipeaters, and gateways are not permitted.

3.8.1. This applies to all forms of active relays or repeaters.

3.8.2. Satellite contacts, where allowed, are not subject to this rule.

3.9. The use of non-Amateur Radio means of communication (for example, Internet or telephone) to solicit a contact (or contacts) during the contest period is not permitted.

3.10. Entrants who qualify for unsponsored plaques may purchase them from the ARRL Contest Branch.

4. ARRL Standard File Format: For Electronic Submission of Contest Entries.

4.1. All files must be in standard ASCII text format.

4.2. The log data file name shall consist of the call sign and the extension ".LOG" for example, K5ZD.LOG

4.3. The summary sheet file name shall consist of the call sign and the extension ".SUM" for example, K5ZD.SUM

4.4. Electronic entries should be sent via Internet to: **contest@arrl.org**

4.4.1. They may be uploaded to the ARRL BBS (860-594-0306).

4.4.2. They may be sent by mail to: ARRL Contest Branch, 225 Main St., Newington, CT 06111.

4.4.2.1. Use an MS-DOS formatted disk, 3.5-inch (720-KB or 1.44-MB).

4.4.2.2. Diskette labels should clearly indicate the call sign used, contest name, entry class, and date of the contest.

4.4.2.3. Include one entry only on each diskette.

4.4.2.4. All diskettes become the property of the ARRL and are not returnable.

4.4.3. They may be sent by Anonymous FTP to **ftp.arrl.org/logs/**

4.4.3.1. If you use a non-Web-browser FTP client, FTP to **ftp.arrl.org** and change directory to /logs, with the command `cd /logs`.

4.4.3.2. Logs received by FTP are not acknowledged by e-mail unless an e-mail message of inquiry is sent to **contest@arrl.org**

4.5. The log file must consist of one line of data per QSO (no more than 80 characters wide), without headers, footers, page breaks or other non-ASCII characters.

4.6. All QSO data must appear in each line, aligned by columns, and must include:

4.6.1. band: wavelength for HF and frequency for VHF.

4.6.2. mode: designator such as CW, PH, etc.

4.6.3. date: in MM/DD/YY or DD/MM/YY format.

4.6.4. time: 4-digit UTC without colons.

4.6.5. call sign of station worked.

4.6.6. complete exchange sent.

4.6.7. complete exchange received.

4.6.8. indication of multipliers: for example an asterisk (*), section/prefix/zone, etc. for the first time the multiplier is contacted.

4.6.9. points claimed: ALL unclaimed QSOs must be "0" points.

Rules, ARRL Straight Key Night

1. Object: This is a friendly meeting on the air using straight keys. Suggested areas of operation of 80, 40, and 20 meters are 60 to 80 kHz from the lower band edges and 10 kHz from the lower Novice-band edges.

2. Date and Time: 24 hours UTC, from 7 PM EST December 31, until 7 PM EST January 1.

3. Exchange: When participating in SKN, use SKN instead of RST preceding the three-digit number to clue in passers-by.

4. Miscellaneous: This is not a contest; quick, contest-like exchanges are discouraged.

5. Reporting: Following SKN, send a list of stations worked, plus your vote for the best first heard (not necessarily one you've worked) and the most interesting QSO you had to ARRL HQ by January 10.

4.7. Multi Operator, Two Transmitter category logs must indicate which transmitter made each QSO.

4.8. In contests that require rest periods, the "times on" and "times off" must be in a separate column.

4.9. A summary sheet is required with all logs, either an official ARRL summary sheet or a close facsimile with a signed contest participation disclaimer. The disclaimer is a statement of acceptance of the conditions of entry.

4.9.1. Electronic entries should include a summary file instead of a paper summary sheet. (The signature is not necessary on an electronic summary sheet (see Rule 2).

4.9.2. All summary sheets must include all pertinent information from, or requested on, the official summary sheet for the particular contest.

5. Paper logs:

5.1. Entrants must use ARRL contest forms, or reasonable facsimiles.

5.2. Contest forms are available:

5.2.1. In the *ARRL Contest Yearbook* (available from the publications sales office of ARRL HQ)

5.2.2. For download at: <http://www.arrl.org/contests/>

5.2.3. By e-mail to info@arrl.org, include the following in the message body (the subject line is ignored):

help
index
quit

5.3. Paper entries with more than 500 QSOs total must include cross-check sheets (dupe sheets).

6. Reporting:

6.1. Entries must be sent to ARRL within 30 days after each contest weekend. For paper entries, this is determined by the postmark.

6.2. Logs not sent by the contest deadline will be classified as checklogs; no extensions, no exceptions.

6.3. Entries received at ARRL more than 30 days after the contest deadline may not be included in *QST* listings.

6.4. All stations are requested to send their entries as early as possible and enclose each entry physically sent to ARRL (for example,

CW and phone) in a separate envelope. Electronic files may all be attached to the same message.

6.5. To be complete, entries must consist of the log and summary sheet. (For electronic entries, you may ZIP the summary sheet file and the log file together using *PKZIP.EXE* or its equivalent, and upload your compressed file or upload the files separately.)

6.6. All operators of multi operator stations must be listed.

6.7. Entrants may submit contest entries as described in Rule 4.4

6.7.1. Entries sent by mail to: ARRL Contest Branch, 225 Main St., Newington, CT 06111, whether on diskette or paper, should include a paper summary sheet and signed disclaimer statement.

7. Disqualification and Penalties:

7.1. If the claimed score of a participant is reduced by 2% or more, the entry may be disqualified. Score reduction does not include correction of arithmetic errors.

7.2. Score reduction may be made for taking credit for unconfirmed QSOs or multipliers, duplicate contacts or other scoring discrepancies.

7.3. An entry with more than two-percent duplicate contacts left in the log or an entry in which more than 2% "rubber clocking" (altering the actual time to increase the operating time so that it is greater than the allowable limit) is detected will be automatically disqualified.

7.4. Participants that are disqualified will be barred from submitting an entry in the next annual running of that specific contest, for example, disqualification from the 1998 phone SS prohibits submission of an entry for the 1999 phone SS, but 1999 CW SS participation is allowable.

7.5. Call signs of all disqualified participants will be listed in the *QST* contest report.

7.6. Any participant on the borderline of disqualification, but not actually disqualified, may receive a warning letter.

7.7. For each duplicate contact that is claimed for credit and each miscopied call sign that is removed from the log by HQ, three additional contacts will be deleted as a penalty. The penalty will not be considered part of the 2% disqualification criteria.

7.8. In all cases of question, the decisions of the ARRL Awards Committee are final.

Rules, 1998 ARRL RTTY Roundup

1. **Object:** Amateurs worldwide contact and exchange QSO information with other amateurs using digital modes (Baudot RTTY, ASCII, AMTOR, and Packet—attended operation only) on 80, 40, 20, 15, and 10 meter bands. Any station may work any other station.

2. **Date and Contest Period:** First full weekend of January, but never on January 1. Begins 1800 UTC Saturday, ends 2400 UTC Sunday (January 3-4, 1998).

2.1. Operate no more than 24 hours.

2.2. Two rest periods (for a combined total of at least 6 hours) must be taken in two single blocks of time, clearly marked in the log.

3. Entry Categories:

3.1. Single Operator:

3.1.1. Low Power.

3.1.2. High Power.

3.2. Multi Operator, Single Transmitter (only).

4. Exchange:

4.1. United States: Signal report and State.

4.2. Canada: Signal report and Province.

4.3. DX: Signal report and serial number, starting with 001.

5. Scoring:

5.1. QSO Points: Count one point for each completed QSO.

5.2. Multipliers: Each US state (except KH6 and KL7), each VE province (plus VE8 and VY1) and each DXCC country. KH6 and KL7 count only as separate DXCC countries.

5.2.1. Count only once (not once per band).

5.2.2. The US and Canada do not count as DXCC countries.

6. Miscellaneous:

6.1. Packet radio contacts made through digipeaters or gateways are not permitted.

7. Awards: Certificates will be awarded to:

7.1. Top high power and low power Single Operator and Multi

Operator scorers in each ARRL/RAC Section.

7.2. Top high power and low power Single Operator and Multi Operator scorers in each DXCC country (other than W/VE).

7.3. Each Novice and Technician Plus entrant.

7.4. Each entrant making at least 50 QSOs.

8. **Other:** See rules for All ARRL Contests and for HF Contests.

Recommended HF Digital Operating Frequencies (MHz)

North and South America	Europe/Africa
3.590 RTTY DX	3.580-3.620
3.605-3.645	
7.040 RTTY DX	7.035-7.045
7.080-7.100	
14.070-14.099.5	14.080-14.099.5
21.070-21.100	21.080-21.120
28.070-28.150	28.050-28.150

Recommended Novice Digital Operating Frequencies

10 meters: 28.100-28.150*
Suggested simplex packet-radio frequencies:
28.102.3
28.104.3
*Authorized power output 200-watts maximum for Novices/Techs only in the 10-meter Novice subband.

Canadian Multipliers

Prefix	Province
VO1, VO2	NF, (LB)
VE1, 9	NB
VE1	NS
VE2	QC
VE3	ON
VE4	MB
VE5	SK
VE6	AB
VE7	BC
VE8	NT
VY1	YT
VY2	PE

8. Club Competition:

8.1. Five ARRL-sponsored contests include an ARRL affiliated club competition:

- 8.1.1. January VHF Sweepstakes
- 8.1.2. (February and March) International DX Contest
- 8.1.3. November Sweepstakes
- 8.1.4. (December) 160-Meter Contest
- 8.1.5. (December) 10-Meter Contest

8.2. Only clubs actively affiliated with the ARRL may participate in the club competition. This means the club:

8.2.1. is affiliated with the ARRL.

8.2.2. has filed an annual report with the Field Services Department of ARRL HQ within the last two years.

8.3. For a club to be listed, the following conditions must be met:

8.3.1. At least three different entries from members of the club must be submitted.

8.3.2. All members wishing to be included in the club score must indicate the club name on their summary sheet.

8.3.3. The club secretary must send a list of all club members eligible to compete for the club (not a club roster) and which level (unlimited, medium, local) they wish to enter for each competition within 30 days after the contest.

8.3.4. A member's score must be shown in the contest results to be counted for a club. Only that score shown in the results (or in subsequent corrections) will count for the club competition.

8.4. There are three categories of club competition:

8.4.1. Unlimited

8.4.1.1. Club submits 51 or more entries.

8.4.1.2. One station can submit two entries—one on CW and one on phone in the November Sweepstakes and the DX Contest.

8.4.1.3. All stations and all operators must reside within 175

miles (282 km) of the club's center.

8.4.1.4. All members must attend at least 2 club meetings per year to be eligible to submit an entry. (If, however, they have not been a member for a year's time, they must have attended a meeting as a member prior to the contest.)

8.4.1.5. Those club members who are disabled in such a way that they are unable to travel are exempt from the two meetings per year rule but they must be regularly active in club affairs.

8.4.1.6. To be considered bona fide, a member must be active in club affairs.

8.4.1.7. Members living outside of 175 miles and members operating stations outside 175 miles may not compete in the club competition. (See rule 8.6.)

8.4.2. Medium

8.4.2.1. Club submits 50 or fewer entries and does not qualify under the local club criteria.

8.4.2.2. One station can submit two entries—one on CW and one on phone in the November Sweepstakes and the DX Contest.

8.4.2.3. The same mileage and attendance requirements apply as the unlimited class club.

8.4.2.4. Members living outside of 175 miles and members operating stations outside 175 miles may not compete in the club competition. (See rule 8.6.)

8.4.3. Local

8.4.3.1. Club submits 10 or fewer entries.

8.4.3.2. One station can submit two entries—one on CW and one on phone in the November Sweepstakes and the DX Contest.

8.4.3.3. All members must reside and operate within 20 miles of the club's center.

8.4.3.4. There is no attendance requirement.

8.4.3.5. Members living outside of 20 miles (32 km) and

Rules, 1998 ARRL International DX Contest

1. Object:

1.1. W/VE amateurs work as many amateur stations in as many DXCC countries of the world as possible on 160, 80, 40, 20, 15, and 10 meter bands.

1.2. Foreign amateurs (including KH6, KL7, CY9, and CY0) work as many W/VE stations in as many of the 48 contiguous states and provinces as possible.

2. Date and Contest Period:

2.1. CW: Third full weekend in February (February 21-22, 1998).

2.2. Phone: First full weekend in March (March 7-8, 1998).

2.3. Contest Period: 48 hours each mode (separate contests). Starts 0000 UTC Saturday; ends 2400 UTC Sunday.

3. Entry Categories:

3.1. Single Operator:

3.1.1. All Band:

3.1.1.1. QRP.

3.1.1.2. Low Power.

3.1.1.3. High Power.

3.1.2. Single Band (one only). Single-band entrants who make contacts on other bands should submit logs of those contacts for checking purposes.

3.1.3. Single Operator Assisted.

3.2. Multi Operator:

1. Single Transmitter.

2. Two Transmitter.

3. Multi Transmitter.

4. Contest Exchange:

4.1. W/VE stations in the 48 contiguous United States and Canada (except in the islands of St Paul and Sable) send signal report and state or province.

4.2. DX stations send signal report and power (three-digit number indicating approximate transmitter output power).

5. Scoring:

5.1. QSO Points—W/VE stations count three points per DX QSO. DX stations count three points per W/VE QSO.

5.2. Multiplier—W/VE stations: Sum of DXCC countries (except US and Canada) worked per band. DX stations: Sum of US states (except KH6/KL7) and District of Columbia (DC), NB (VE1, 9), NS

(VE1), QC (VE2), ON (VE3), MB (VE4), SK (VE5), AB (VE6), BC (VE7), NT (VE8), NF (VO1), LB (VO2), YT (VY1), PE (VY2) worked per band. Maximum of 62 per band.

5.3. Final Score—QSO points \times multiplier = final score.

6. Miscellaneous:

6.1. Your call sign must indicate your DXCC station location (KH6XYZ/W1 in Maine, FS/FGOAAA on St Martin, etc.).

6.2. The same station may be worked only once per band—no crossmode or repeater contacts.

6.3. Aeronautical and maritime mobile stations outside the US and Canada may be worked by W/VE stations for QSO credit only.

7. Awards:

7.1. Plaques (if sponsored) will be awarded in the following categories for both the CW and phone contests.

7.1.1. Top W/VE scorer in each entry category—single operator-all band-QRP, single operator-all band-low power, single operator-all band-high power, single operator-single band (160-10 Meters), single operator assisted, multi operator-single transmitter, multi operator-two transmitter, multi operator-multi transmitter.

7.1.2. Top scorer in the single operator-all band category worldwide and on each continent. In addition, worldwide leaders in the single operator-all band-QRP, single operator-all band-low power, single operator-single band, single-operator assisted, multi operator-single transmitter, multi operator-two transmitter and multi operator unlimited categories will receive plaques.

7.2. Certificates will be awarded to:

7.2.1. top single operator-all band entries (QRP, low power, and high power) from each country and ARRL/RAC Section

7.2.2. top single-band entries in each US call area and each country

7.2.3. top single operator assisted entries in each country, US call area and in Canada

7.2.4. top multi operator entries (single, two and multi transmitter) in each country, US call area and in Canada

7.2.5. DX entrants making more than 500 QSOs on either mode will receive certificates.

7.2.6. Additional single-band and multi operator certificates will be awarded if significant effort or competition is displayed.

8. Other: See rules for All ARRL Contests and for HF Contests.

members operating stations outside 20 miles may not compete in the club competition. (See rule 8.6.)

8.5. Single Operator and Multi Operator station scores may be counted.

8.5.1. At a guest-operated single-operator station, both the guest operator and the station licensee must be members of the same club in order to count the score for that club.

8.5.2. At multi operator stations, at least 66% of the operators must be members of the same club for the score to count for that club.

8.5.3. A multi operator entry may (optional) utilize non-member operators licensed one year or less without including such operators in the above 66% calculation. (The intent here is to encourage clubs to recruit contesters from newer amateurs without adversely affecting the club aggregate score.)

8.6. For the ARRL International DX Contest, DXpeditions (operating outside the United States and Canada) scores may be counted for either single operator or multi operator stations even though the operation is outside the club's area.

8.6.1. For single guest operators at a DX station, only the operator must be a club member and meet all other criteria.

8.6.2. For multi operator stations, the score counts for only one club and at least 66% of the operators must be members of that club and meet all other criteria.

8.7. In conjunction with the two meetings per year rule, the club must hold at least four in-person meetings per year.

8.8. A club's entry classification may be changed if, in the opinion of the ARRL Awards Committee, the club has manipulated its number of entries to fall into a lower classification (for example, if a club with 100 members submits only the 10 highest scores, even if more than 10 of its members wish to compete.)

8.9. It is not within the intent of these rules that a club should vote out a member or that a member resign and then be voted back into the club later so the member-attendance rule can be met.

8.10. The highest scoring active affiliated club entry in each category (unlimited, medium, local) will be awarded a gavel.

General Rules for ARRL Contests on bands below 30 MHz (HF)

1. General Rules:

1.1. See General Rules for All ARRL Contests.

1.2. Cross-mode contacts are not permitted.

2. Entry Categories: The following categories are defined for ARRL contests on bands below 30 MHz. See the rules for each contest to determine which categories apply, and whether additional categories exist for that contest.

2.1. Single Operator: One person performs all transmitting, receiving, spotting, and logging functions as well as equipment and antenna adjustments.

2.1.1. Use of spotting assistance or nets (operating arrangements involving other individuals, DX-alerting nets, PacketCluster, etc.) is not permitted.

2.1.2. Single-Operator stations are allowed only one transmitted signal at any given time.

2.1.3. Single Operators may be divided into sub-categories based on power output:

2.1.3.1. **QRP:** 5-W PEP output or less.

2.1.3.2. **Low Power:** 150-W PEP output or less.

2.1.3.3. **High Power:** More than 150-W PEP output.

2.2. Single Operator Assisted: One person performs all transmitting, receiving, and logging functions as well as equipment and antenna adjustments.

2.2.1. Use of spotting assistance or nets (operating arrangements involving other individuals, DX-alerting nets, PacketCluster, etc.) not physically located at the station is permitted.

2.2.2. Single Operator Assisted stations are allowed only one transmitted signal at any given time, not including transmissions on a spotting net.

2.3. Multi Operator: More than one person performs transmitting, receiving and logging functions, etc. Multi Operator stations may be divided into sub-categories:

2.3.1. **Multi Operator, Single Transmitter:** Stations are allowed only one transmitted signal at any given time

2.3.1.1. In those contests that do not have Single Operator

Assisted class, includes those single operators that use any form of spotting assistance such as from nets or PacketCluster.

2.3.1.2. Includes those that receive assistance with logging or relief operators, etc.

2.3.1.3. Limited to 6 band changes (maximum) in any clock hour.

2.3.1.3.1. The clock hour is from zero through 59 minutes.

2.3.1.3.2. Band changes are defined so that, for example, a change from 20 meters to 40 meters and then back to 20 meters constitutes two band changes.

2.3.1.4. Violation of the 6 band changes rule or improper logging will result in an entry reclassification to the Multi Operator Multi Transmitter class.

2.3.2. Multi Operator, Two Transmitter:

2.3.2.1. A maximum of two transmitted signals at any given time, on different bands.

2.3.2.2. Each transmitter is limited to 6 band changes (maximum) in any clock hour.

2.3.2.2.1. The clock hour is from zero through 59 minutes.

2.3.2.2.2. Band changes are defined so that, for example, a change from 20 meters to 40 meters and then back to 20 meters constitutes two band changes.

2.3.2.3. Violation of the 6 band changes rule or improper logging will result in an entry reclassification to the Multi Operator Multi Transmitter class.

2.3.2.4. Both transmitters may work any and all stations; the second transmitter is not limited to working new multipliers only.

2.3.2.5. Each of the two transmitters must keep a separate, chronological log for the entire contest period.

2.3.3. Multi Operator, Multi Transmitter:

2.3.3.1. A maximum of one transmitted signal per band at any given time.

2.3.3.2. Multi Operator, Multi Transmitter stations must keep a separate, chronological log for each band for the entire contest period.

General Rules for ARRL Contests on bands above 50 MHz (VHF)

1. General Rules:

1.1. See General Rules for All ARRL Contests.

1.2. Individuals and stations are limited to one entry per contest.

1.3. A transmitter, receiver, or antenna used to contact one or more stations may not be subsequently be used under any other call during the contest period, except as provided for in General Rule for All ARRL Contests number 3.5.

1.4. Stations may be worked for credit only once per band from any given grid square, regardless of mode. This does not prohibit working a station from more than one grid square with the same call sign (such as a Rover).

1.5. Crossband QSOs do not count.

1.6. Aeronautical mobile contacts do not count.

1.7. Retransmitting either or both stations, or use of repeater frequencies, is not permitted.

1.7.1. This prohibits use of all repeater frequencies.

1.7.2. Contest entrants may not transmit on repeaters or repeater frequencies for the purpose of soliciting contacts.

1.8. Use of the national simplex frequency, 146.52 MHz, or immediate adjacent guard frequencies is prohibited.

1.8.1. Contest entrants may not transmit on 146.52 for the purpose of making or soliciting QSOs.

1.8.2. The intent of this rule is to protect the national simplex frequency from contest monopolization.

1.8.3. There are no restrictions on the use of 223.50 MHz.

1.9. Only recognized simplex frequencies may be used, such as 144.90 to 145.00; 146.49, .55 and .58, and 147.42, .45, .48, .51, .54 and .57 MHz on the 2-meter band.

1.9.1. Local-option simplex channels and frequencies adjacent to the above that do not violate the intent of the above rules, or the spirit and intent of the band plans as recommended in the *ARRL Repeater Directory*, may be used for contest purposes.

1.10. While no minimum distance is specified for contacts, equipment should be capable of communications at a range of at least 1 km.

1.11. A station located precisely on a dividing line between grid squares must select only one as the location for exchange purposes. A different grid-square multiplier cannot be given out without moving the complete station (including antennas) at least 100 meters.

1.12. Above 300 GHz, contacts are permitted for contest credit only between licensed amateurs using coherent radiation on transmission (for example, laser) and employing at least one stage of electronic detection on receive.

1.13. Marine Mobile (and Maritime) entries will be listed separately as "Marine Mobile" in the listings and compete separately for awards.

1.14. Participants are reminded that the segment 50.100-50.125 MHz should be used for intercontinental QSOs only, using 50.125 MHz as a calling frequency then QSY after contact is established.

2. Entry Categories: The following categories are defined for ARRL contests on bands above 50 MHz. See the rules for each contest to determine which categories apply, and whether additional categories exist for that contest.

2.1. Single Operator: One person performs all transmitting, receiving, spotting, and logging functions as well as equipment and antenna adjustments.

2.1.1. Use of spotting assistance or nets (operating arrangements involving other individuals, DX-alerting nets, Packet

Cluster, etc.) is not permitted.

2.1.2. Single Operator stations are allowed only one transmitted signal at any given time.

2.1.3. Single Operator stations compete for all-band and single-band awards.

2.1.4. Overall and single-band winners are recognized both in QST score listings and in awards offered.

2.2. Single Operator, QRP Portable: (not for home stations or fixed stations)

2.2.1. 10-W PEP output or less.

2.2.2. Portable power source.

2.2.3. Portable equipment and antennas.

2.3. Rover: One or two operators of a single station that moves among two or more grid squares during the course of a contest.

2.3.1. A rover vehicle may transport only one station using a single call sign.

2.3.2. A rover may not operate with more than one call sign.

2.3.3. Rover vehicles must transport all the equipment, power supplies, and antennas used at each operating site.

2.3.4. Rovers sign "rover" on phone and /R on CW after their call sign.

2.3.5. All Rovers are encouraged to adopt operating practices that allow as many stations as possible to contact them.

2.3.6. Rover operators may submit separate logs for single operator (fixed station) in addition to their rover entries.

2.4. Multi Operator: More than one person performs transmitting, receiving and logging functions, etc. Stations must locate all equipment (including antennas) within a circle whose diameter does not exceed 300 meters (1,000 feet). Multi operator stations may be divided into sub-categories:

2.4.1. Multi Operator (Unlimited):

2.4.2. Limited Multi Operator: Stations submit logs with a maximum of four bands used. (Logs from additional bands used, if any, should be included as checklogs.)

Rules, 1998 January VHF Sweepstakes

1. Object: To work as many amateur stations in as many different 2 degrees \times 1 degree grid squares as possible using authorized frequencies above 50 MHz. Foreign stations work W/VE amateurs only.

2. Date and Contest Period: The weekend before the NFL Super Bowl. Begins 1900 UTC Saturday, ends 0400 UTC Monday (January 17-19, 1998).

3. Entry Categories:

3.1. Single Operator.

3.2. Single Operator, QRP Portable.

3.3. Rover.

3.4. Multi Operator.

3.5. Limited Multi Operator.

4. Exchange: Grid-square locator (see April 1994 QST, p 86).

4.1. Exchange of signal report is optional.

5. Scoring:

5.1. QSO points:

5.1.1. Count one point for each complete 50- or 144-MHz QSO.

5.1.2. Count two points for each 222- or 432-MHz QSO.

5.1.3. Count four points for each 902- or 1296-MHz QSO.

5.1.4. Count eight points for each 2.3-GHz-or-higher QSO.

5.2. Multiplier: The total number of different grid squares worked per band. Each 2 degrees \times 1 degree grid square counts as one multiplier on each band it is worked.

5.3. Final score: Multiply the total number of QSO points from all bands operated by the total number of multipliers for final score.

5.4. Rovers only: The final score consists of the total number of QSO points from all bands times the sum of unique multipliers (grid squares) worked per band (regardless of which grid square they were made in) plus one additional multiplier for every grid square activated (made a contact from).

5.4.1. Rovers are listed in the contest score listings under the Division from which the most QSOs were made.

6. Miscellaneous:

6.1. Stations may be worked for credit only once per band from

any given grid square, regardless of mode. This does not prohibit working a station from more than one grid square with the same call sign (such as a Rover).

6.2. Only one signal per band (6, 2, 1 $\frac{1}{4}$, etc) at any given time is permitted, regardless of mode.

6.3. Multi operator stations may not include QSOs with their own operators except on frequencies higher than 2.3 GHz. Even then, a complete, different station (transmitter, receiver and antenna) must exist for each QSO made under these conditions.

7. Awards: Certificates will be awarded in the following categories.

7.1. Single operator.

7.1.1. Top single operator in each ARRL/RAC Section.

7.1.2. Top single operator on each band (50, 144, 222, 432, 902, 1296 and 2304-and-up categories) in each ARRL/RAC Section where significant effort or competition is evident. (Note: Since the highest score per band will be the award winner for that band, an entrant may win a certificate with additional single-band endorsements.) For example, if WB0TEM has the highest single-operator all-band score in the Iowa Section and his 50- and 222-MHz scores are higher than any other Iowa single operator's, he will earn a certificate for being the single-operator Section leader and endorsements for 50 and 222 MHz.

7.2. Top single-operator, QRP portable in each ARRL/RAC Section where significant effort or competition is evident. (Single-operator, QRP portable entries are not eligible for single-band awards.)

7.3. Top rover in each ARRL Division and Canada where significant effort or competition is evident. (Rover entries are not eligible for single-band awards.)

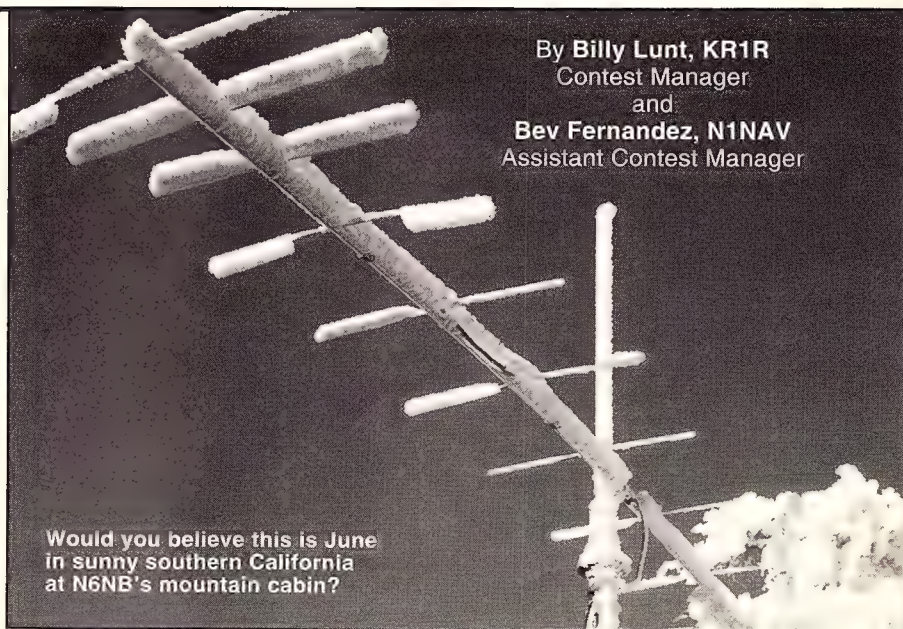
7.4. Top multi operator score in each ARRL/RAC Section where significant effort or competition is evident. (Multi operator entries are not eligible for single-band awards.)

7.5. Top limited multi operator in each ARRL/RAC Section where significant effort or competition is evident. (Limited multi operator entries are not eligible for single-band awards.)

8. Other: See rules for All ARRL Contests and for VHF Contests.

QST

1997 ARRL June VHF QSO Party Results



By Billy Lunt, KR1R
Contest Manager
and
Bev Fernandez, N1NAV
Assistant Contest Manager

Would you believe this is June
in sunny southern California
at N6NB's mountain cabin?

Nice weather and good propagation are a VHF contester's dream come true. During this year's June VHF QSO Party we at least had the good weather, and a few short band openings thrown in to boot. You would think that everyone would be tickled pink—not so. If the openings had lasted a little longer, folks would have been smiling, but judging by the

comments we received, participants were a little disappointed after last year's exceptional band openings. We, as testers, want it all!

But we did enjoy some decent propagation. Six meters was pretty hot with some nice E-skip openings both days. When the band opened, some folks were working stations 2000 miles or so away. Doug, VE5UF, worked over 500 stations on 6 meters alone—that's almost as many as the multiop winner W2SZ's 674 6-meter QSOs.

Two meters and 70 cm experienced some delightful band enhancements as well. Several operators reported short openings with contacts out to 500 or 600 miles. Even so, it was the short-haul contacts that provided most QSOs.

We had plenty of participation. There were 837 entries processed by the Contest Branch this year, and you can count on a few more that didn't send their logs to Headquarters. Always submit your entries, to show support for the contest, if nothing else.

Tom, WA8WZG, put in a tremendous effort again from his Ohio location. He surely took advantage of the many participants and used his microwave capability to secure a first-place single operator win. Tom also completed a few contacts using moonbounce, picking up at least seven additional multipliers. Great going, Tom! Connecticut's WA2TEO, wasn't far behind in second place with 350,000 points, and Southeast Region champ, Joel, W5ZN, was third with 288,000.

Zack, W1VT, again took to the hills of southern Vermont trying to set a new QRP Portable score record. Zack didn't set the record he was after, but came away with the first-place QRP Portable plaque. Burt, W8TL/3, operating in the Maryland/DC section, was second with 58,000 points, and Bob, W2XL, from Eastern New York, was third with 33,000.

Perennial winners W2SZ/1 did it again! Operating from their favorite spot, Mt. Greylock, the highest peak in Massachusetts, they took the first-place multioperator plaque

scoring 1.1 million points. The crew at K3MQH gave it a good try finishing in second place with 936,000 points. Central Region leader, AA9D, was third with 790,000 points.

Operating in West Virginia, K8GP easily took top honors in the limited multioperator category scoring 547,000 points. W0UC, from Wisconsin, finished in second place with 245,000 points, and W8ULC, operating in



KE6GFI, doing just what you are supposed to do during the contest—having fun. She was operating from the ORG section using only a 5-W FM hand-held.



WV0H operating in South Dakota, or just hanging around? No, this is not what you're supposed to do with the antennas.

Region Box

Northeast Region

(New England, Hudson and Atlantic Divisions; Maritime and Quebec Sections)

WA2TEO	350,058	S
K1RZ	243,698	S
N2CEI	225,862	S
W3OR	171,193	S
KD1DU	135,564	S

W1VT	107,136	Q
W8TL/3	58,788	Q
W2XL	33,201	Q
K1VZI	2,058	Q
KB2ZNN	1,764	Q

W2SZ/1	1,164,030	M
K3MQH	936,018	M
W3CCX	721,413	M
K3YTL	601,529	M
K2TXB	319,784	M

K1TR	206,302	L
N2HLT	175,216	L
W1SJ	127,616	L
W1QK	113,740	L
AB2I	74,025	L

W2FU	127,410	R
W3EKT	70,720	R
N1MJD	60,588	R
N3LJK	37,730	R
KA2CKI	35,441	R

Southeast Region

W5ZN	288,320	S
K2UOP/8	117,025	S
N8UM	103,713	S
N4KW	58,295	S
NS4W	41,114	S

KE4VCS	574	Q
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W4IY	565,740	M
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K8GP	547,143	L
W4NH6	2,040	L
N4ZWQ	23,474	L
W4BFB	21,004	L
KD4ZMR	17,250	L

AB4CR	214,000	R
K4EFD	90,830	R
KA8IFC	64,375	R
WB2QLP	44,323	R
KC4ZRH	18,673	R

Central Region

WA8WZG	395,031	S
KE8FD	160,160	S
K8TQK	107,100	S
K2YAZ	101,752	S
W9IIX	87,450	S

N8XA	11,390	Q
N9TZL	7,656	Q
N8LGP	1,474	Q
KA8NRC	756	Q
WD9IAB	405	Q

AA9D	790,641	M
WW8M	150,400	M

W0UC	245,180	L
W8ULC	216,726	L
N9LAG	163,850	L
KU8Y	156,604	L
K8EB	102,834	L

N9MWB	92,452	R
WB9SNR	75,285	R
W9FR	20,825	R
W9FX	20,825	R
N9GH	14,091	R

Midwest Region

N5HHS	86,880	S
VE5UF	65,274	S
N0LL	64,255	S
W0QP	56,940	S
WA0BWE	54,404	S

N0IVN	13,462	Q
WA5DJJ	1,914	Q
K6LS	280	Q
W0QNX	252	Q

W0ZQ	223,491	M
KB5IUA	82,992	M
N5WS	66,129	M
KK5IH	36,025	M
VE5NN	25,398	M

W5KFT	92,224	L
W1XE	76,038	L
W7XU	72,581	L
N0AC	44,800	L
VE4ZK	42,090	L

N0BEL	22,568	R
WB5VYE	20,970	R
KK5RH	19,240	R
W5DF	13,250	R
WR0I	13,207	R

West Coast Region

N6NB	65,331	S
WB5OMF	37,674	S
N6HKF	31,372	S
KG6EG	30,780	S
W7EW	30,081	S

KK6KE	22,134	Q
W6ZQ	13,288	Q
N6JO	12,430	Q
KD6RMS	4,092	Q
KE6GFF	4,004	Q

W6AMT	154,310	M
K7VHF	90,156	M
WA5YWC	74,354	M
K6ARP	61,952	M
N7LQ	50,274	M

WB2ODH/6	201,790	L
WA6TBO	93,240	L
W3SE	76,167	L
VE6JW	35,046	L
WB6AAG	34,532	L

K7XC	65,664	R
N6MZ	42,230	R
KM6RH	27,189	R
K6ALE	25,074	R
AF6O	24,366	R

Key: L = Limited multioperator; M = Multioperator; Q = QRP portable; R = Rover; S = Single operator

Plaque Winners

Single Operator

1st	WA8WZG	395,031	Mt. Greylock Expeditionary Force, W2SZ/1
2nd	WA2TEO	350,058	Bald Knob VHF Contest Group, AA9D
3rd	W5ZN	288,320	Ed Parsons, K1TR
4th	K1RZ	243,698	Wellesley ARS, Mt. Equinox Contest Crew
5th	N2CEI	225,862	KS VHF/UHF OPs Annual on the Hill Get Together
6th	W3OR	171,193	South Mountain Contest Team, K3MQH
7th	KE8FD	160,160	John Butovich, W5UWB, in Memory of John Chambers, W6NLZ
8th	KD1DU	135,564	
9th	K1RO	127,127	
10th	K2UOP/8	117,025	

QRP Portable

1st	W1VT	107,136	K2OVS & K2RIW
2nd	W8TL/3	58,788	West Coast VHFer
3rd	W2XL	33,201	
4th	KK6KE	22,134	
5th	N0IVN	13,462	

Rover

1st	AB4CR	214,000	W2SZ/1, In Memory of Dick Goodman, WB1HII
2nd	W2FU	127,410	Wayne King, N2WK
3rd	N9MWB	92,452	Northern Lights Radio Society & W0UC
4th	K4EFD	90,830	K5AM
5th	WB9SNR	75,285	

Multioperator

1st	W2SZ/1	1,164,030	Randy Stegemeyer, W7HR
2nd	K3MQH	936,018	N2LIV, N2GHR, N2BFJ Contest Team
3rd	AA9D	790,641	Mt. Airy VHF Club
4th	W3CCX	721,413	Rochester VHF Group
5th	K3YTL	601,529	Flagpole Knob Contest Group, W4IY
6th	W4IY	565,740	Schenectady ARA, K2AE
7th	K2TXB	319,784	In Memory of Sid Krauss, WA2VKN
8th	N2YB	297,909	
9th	KB1BWB	252,938	
10th	W0ZQ	223,491	

Limited Multioperator

1st	K8GP	547,143	W3EP/K9AKS/W9IP
2nd	W0UC	245,180	North East Weak Signal Group
3rd	W8ULC	216,726	WA2TEO, W2GKR, W2GKO, KA1FVG
4th	K1TR	206,302	
5th	WB2ODH/6	201,790	

DX Single Operator

1st	YC2OK	14,040	Bill Tynan, W3XO
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DX Multioperator

1st	CO0FRC	3,270	Robert J Carpenter, W3OTC
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Ohio, finished third with 216,000.

Jack, AB4CR (+N4GN), activating 14 grids, lead the way among the Rovers scoring 214,000 points. W2FU was second with 127,000 points, and N9MWB was third with 92,000.

Check all the boxes for more information. There are plenty of data that might help you in preparing for next year's contest. Don't wait till the last minute to get everything ready. Start planning and testing now. See you June 13-15 for the 1998 ARRL June VHF QSO Party.

SOAPBOX

I found lots of CW on 2 meters, but what happened to 6 CW? (K1VW). Had a great time on VHF Contest operating 6 meters and 2 meters. Best QSO was with VE5UF in DO61 (AD1B). What a pleasant surprise on Saturday night to work WA6KLK in DN12 on 50 MHz (KQ1V). This year's contest was a real treat! Mother Nature supplied great band conditions, as well as sunny weather. I worked many new grids. That just goes to show you how popular 6 meters is becoming (N2TMT). Only had a couple of hours to devote to this contest. Where



K6KWQ, WB2ODH, N6RMJ, stringing coax on the 220 array. This LAX based group finished 5th place among 100 limited multiop entries.

was the 6 meter opening? (WA4GPM). Not much free time this year, I heard some band openings but they seemed shortlived. I always enjoy working the June VHF QSO Party (KD4ZO). There were very poor conditions from our location. Maybe September will be better (W4CMA). We had two surprises in this contest, 432 was almost dead, and 6 meters was a blast. I enjoyed it very much (KC4JGS). This was the first time for me working this contest. I'm not sure if I had a good or bad score. I am always looking to improve my station. I don't know what to do next. Erect bigger antenna or just higher ones (KE4HGD). Where was 6 meters? There was good local participation, but I only caught two short periods of skip. Still had a great time and am looking forward to the next contest (AD4F). It was great to hear more activity on the higher bands. I even netted a couple of new grids on 6 meters (KH2CY). Had a couple of 6 meter openings, one to Canada and the other to Texas, but nothing like last year (AD4TJ). It was rare for a June VHF QSO Party to have more QSOs and Grids on 2 meters than on 6 meters (W8CM). My amplifier blew up at 1700Z on Sunday, but with the sorry band conditions it didn't really matter (KB5ZFO). Three cheers for the rovers that kept the activity up during flat band conditions (KB5IUA). I coerced my wife's daughter Stephanie, KF6BAN, to operate my station. She was very apprehensive, but made seven contacts on 222 MHz, and was disappointed it ended so soon. Now, she can't wait for the next contest (KQ6DI).

Single Operator

50 MHz				144 MHz				222 MHz				432 MHz				902 MHz				1296 MHz			
VE5UF	506	K3EW	390	WA8WZG	95	WA8WZG	167	WA8WZG	42	WA8WZG	76												
N5HHS	363	WA2TEO	366	WA2TEO	81	WA2TEO	150	WA2TEO	35	WA4VHF	57												
WA2TEO	295	KD1DU	322	K1RZ	75	K1RZ	122	K1RZ	30	K1RZ	47												
N1MIA	274	WB2QOQ	312	N2CEI	72	W5ZN	115	N2CEI	29	WA2TEO	45												
WA2WQZ	266	K1RZ	269	KE8FD	69	KE8FD	107	K2UOP/8	27	N2CEI	37												
K1RO	265	K1RO	265	KD1DU	67	K5MA	106	WB2DNE	26	K2UOP/8	36												
K1RZ	257	KB2ZVP	262	K5MA	56	W3OR	103	KD1DU	23	KD1DU	33												
N2CEI	255	N2CEI	209	WB2DNE	56	KC6ZWT	89	W5ZN	23	W7LVO	32												
K0GU	246	WA8WZG	209	K1RO	55	N2CEI	88	W3OR	22	W5ZN	30												
K5MA	241	KE8FD	208	K2UOP/8	55	KD1DU	88	WA1MBA	20	WB5OMF	29												
WD4MGB	235	W5ZN	205	W3OR	55	N3OPM	86	WA2ONK	19	KE8FD	29												
WA0BWE	226	W3OR	202	KQ6DI	52	K8TQK	86	N2GHR	19	W3OR	28												
NN9KØ	214	N2MH	197	KC6ZWT	50	K2UOP/8	85	KE8FD	17	N2GHR	27												
WA8WZG	212	K0MQS	189	VE3AX	49	K1RO	84	K2AN	17	WA1MBA	27												
VE3RM	208	K5MA	187	WD9EXD	49	KG6EG	84	N9WRO	15	KE6WWL	27												
				K8TQK	49					K8TQK	27												

Multioperator

50 MHz		144 MHz		222 MHz		432 MHz		902 MHz		1296 MHz	
W2SZ/1	674	K3MQH	864	K3MQH	187	K3MQH	305	W2SZ/1	80	W2SZ/1	95
K8GP -L	653	K3YTL	585	WB2ODH/6 -L	154	W2SZ/1	297	W3CCX	51	W6AMT	73
K3MQH	558	W2SZ/1	569	W2SZ/1	154	W3CCX	241	K3YTL	34	W3CCX	67
AA9D	555	W3CCX	520	W3CCX	136	N9LAG -L	219	N2YB	33	AA9D	56
W3CCX	537	W4IY	517	K3YTL	119	K3YTL	198	AA9D	30	K3YTL	54
W0UC -L	526	K8GP -L	428	N9LAG -L	116	AA9D	196	K3MQH	25	K3MQH	51
W4IY	519	AA9D	368	K8GP -L	109	K8GP -L	177	W4IY	23	N2YB	41
KB1BWB	468	W1SJ -L	366	AA9D	107	W4IY	174	K2TXB	22	W4IY	37
K1TR -L	456	K3UZY -L	355	W4IY	98	WB2ODH/6 -L	149	W3IP	21	WW8M	35
K3YTL	426	N9LAG -L	343	N2YB	97	W6AMT	142	WW8M	17	WA5YWC	34
K2TVI	412	AB2I -L	339	W6AMT	92	N2HLT -L	140	W0ZQ	14	K2TXB	34
N2WM	406	W1QK -L	337	K1TR -L	82	N2YB	131	K2TVI	11	W3IP	31
K2TXB	396	KB1BWB	321	N2HLT -L	80	K1TR -L	120	KB1BWB	11	K6WC -L	30
W0ZQ	394	WB2ODH/6 -L	309	W3SE -L	74	W3SE -L	116	K2BAR	10	K7VHF	24
KU8Y -L	382	K2BAR	305	K2TVI	73	KB1BWB	116	N2WM	9	K6PUD -L	21
								K7VHF	9	W0ZQ	21

Single Operator

50 MHz			144 MHz			222 MHz			432 MHz			902 MHz			1296 MHz		
K0GU	132	KE8FD	63	KE8FD	40	KE8FD	43	W5ZN	20	WA8WZG	30						
VE5UF	129	K0MQS	59	WA8WZG	36	WA8WZG	41	WA2TEO	19	W5ZN	22						
NN9K/Ø	128	K8TQK	59	K8TQK	32	K8TQK	40	N2CEI	19	N2CEI	21						
N5HHS	120	WD9EXD	54	WD9EXD	31	W5ZN	36	WA8WZG	18	WA2TEO	19						
N0LL	110	W9IIX	48	W5ZN	30	WA2TEO	35	WB2DNE	18	KE8FD	18						
K5AM	104	WA2TEO	48	N2CEI	30	VA3ST	31	K1RZ	16	WA4VHF	18						
VE3RM	93	VE3AX	48	WA2TEO	28	K1RZ	31	K2UOP/8	15	K1RZ	17						
WD4MGB	93	WA8WZG	48	VE3AX	28	W3OR	31	W3OR	13	K2UOP/8	17						
WA2TEO	88	K2YAZ	46	K1RZ	26	N2CEI	31	WA1MBA	11	K8TQK	16						
NT0V	83	W5ZN	46	KD1DU	25	VE3AX	30	KE8FD	11	KE6WWL	15						
W8MM	81	N8UM	45	VA3ST	25	W9IIX	30	N2GHR	11	W3OR	14						
N8UM	78	N9AG	44	WB2DNE	25	W4VHH	29	KD1DU	11	W4VHH	13						
KW9KW	78	KA9QFL	44	W3OR	25	K8MR	29	WA2ONK	10	N2GHR	13						
W9RM	76	W8CM	42	K2YAZ	23	WQ0P	29	KB3IB	9	WA1MBA	13						
WD5K	76	K1RZ	42	K2UOP/8	23	A8BQ	27	K2AN	9	KD1DU	12						
WA2WQZ	76					K2UOP/8	27			N4KYV	12						

[illegible]

-L denotes Limited Multioperator

Scores

Each line score lists call sign, score, stations worked, multipliers, number of grids activated (if Rover), entry category and bands (A= 50 MHz, B = 144 MHz, C = 222 MHz, D = 432 MHz, 9 = 902 MHz, F = 1296 MHz, F = 2304 MHz, G = 3456 MHz, H = 5760 MHz, I = 10 GHz, J = 24 GHz, K = 47 GHz, L = 75 GHz, M = 119 GHz, N = 142 GHz, O = 241 GHz, P = 300+ GHz). Call signs of division leaders and band indicators are listed in boldface type.

Connecticut																										
WAT2EO	350,058	687	246	5	ABCD9EFG	W1QK (+N1ABY,Ka1SYG,AA1MY,N1TMG,N1GS, W1QJ,N1T1V)				W1LXP	126	14	9	S	A	Rhode Island										
KD1U	135,364					113,740 785 121 L ABCD				K1VZI	2,058	79	21	Q	ABCD	KM1X 46,060 415 94 S ABD										
K1RO	127,127	696	143	5	ABCD9E	W1XA (+K1JN,Ka1N1HRA,Ka1BE1A,Ka1VMG)				N1EJOY	338	26	13	Q	A	K8BGZ 1,200 60 20 S A										
K1EM	44,523	379	97	8	ABCD9E	27,459 272 81 L ABD				K1AER (+N1IA) 26,144 268 76 L ABCD										K1DS 507 36 13 S ABC						
N1NQD	30,461	284	83	5	ABCD	W1XX (+K1JN,WB1A) 13,496 241 56 L AB														K1W 154 22 2 S AB						
W1COT	25,160					W1NRG (+N1JC,WB1EA) 1,976 76 26 L A														N1XT 80 11 5 ABC						
K1VW	7,518	171	42	2	ABCD															K1MUJ (Ka1ZNZ,K1ZE,ops) 29,756 251 86 M ABCDE						
N1WXX	4,590	94	45	5	ABCD																					
K8WVQ	2,337	89	33	2	AB																					
K1RT	2,277					Eastern Massachusetts																				
W1QJL	1,386	59	18	5	ABCD9E	K5MA 90,244 390 108 S ABCD				New Hampshire																
N1WPB	1,216	72	16	2	AB	N1WGT 57,348 370 108 S ABCD9EHI				AF1T	82,944	461	128	S	ABCD9EFP											
N1BAH	1,206	67	18	2	AB	WG1Z 25,919 275 67 ABCDE				AC1J	17,487	213	67	S	ABCD											
WB5MY1	774	43	18	2	AB	KK1C 23,322 247 69 S ABCD9E				W1T	14,770	70	70	S	ABCD											
K8CH	556	41	18	2	AB	W1WV 14,080 190 64 ABCD				KU2A	6,960	111	40	S	ABCD9E											
N1SFE	480	48	8	5	BD	W1PM 14,042 142 56 ABD				N1HJH	2,592	76	27	S	ABD											
W1AW (N1UQ,op)						N1PM 3,360 67 48 S ABD				W1QWJ	2,475	75	33	S	AB											
						N1EKV 1,746 68 18 BD				W1QJ	455	25	S	ABCD												
						N1VQZ 1,584 66 22 S ABD				Vermont																
						N1FDX 24,456 56 24 S				W1AM	37,403	269	113	S						ABCD9E						
N1WCL	385	35	11	Q	AB	AD1B 1,080 54 20 AB				K1LPS	11,080	132	70	S	ABCD9E											
N1QVO	196	25	7	Q	ABD	N1DIRS 918 48 17 S ABCD				N1LZC	15,517	160	59	S	ABCD9EF											
KB1WBW (A1J,Ka1ZE,N1DPM,N1MUW,N1SAG, W21V,ops)	252,938	997	203	M	ABCD9EFG	K1HC 605 55 11 B				WB1FLD (+Ka1FYB,N1NUM,N1RUZ,N1EDM, Aa1GU)	63,365	436	115	L	ABCD											
						W1RYS 442 3														N1FUS 10,019 191 45 S ABD						
																				N1YUW 114 27 1 S ABC						

KD1XP 510 45 10 S ABCD
K1JG 270 18 15 S A
KR1H 224 28 10 Q A
W252J1 (AA1AA,W1VE,WA1ZNA,W2YH,N2YCA,
WA2SPL,K1DH,N1XSY,K2AD,N2GXH,N2YZO,
W2S2B,K1EP,KA1DZV,K2TR,N2HPA,W2ARQ,
KE4IBF,W1SZ,KA1PRT,KE2TP,N2XRE,WA2AAU,
WA8USA,ops)
1,164,030 2045 345 M ABCD9EFGHIJK
K1AE 2448 288 71 L AB
N1RWM 9,292 202 46 L AB

2

Eastern New York

K2ZZ 30,646 324 77 S ABCD
WB2DUS 20,915 169 89 S ABCDE
WA2WQZ 20,216 266 76 A
W3HHN 18,348 209 66 ABCDE
N2MSS 15,532 249 44 S ABCD9E
K3EW 12,090 390 31 B
N21QW 10,692 167 54 ABD
N2TMT 6,424 146 44 A
W2CCT 5,188 136 38 B
N2NCO 3,299 107 23 ABCD
W2JHO 2,014 80 19 ABCD
K2ABAH 1,162 72 14 ABCDE
W2RJS 688 43 16 S B
K2MCS 468 32 12 ABCDE
N2ZOE 462 65 8 BD
A2CVC 432 29 12 ABCD
KB2TPD 396 38 9 BD
K2BRY 255 51 5 S B
N2WJW 150 30 5 S B
W2FRW 1 1
W2XL 33,201 265 93 Q ABCD9E
KD2IX 1,695 81 15 Q BD
K2TVI (W2VVS,VE3IE,N2DVQ,N2HTT,N2NWZ,
N2DHH,N2FMC,N2GKM,WB2NHC,K2ZVI,N3EMF,
N2GDY,ops)
175,338 884 153 M ABCD9EFH
W1S1J (+N2YHK)
127,616 821 128 L ABCD
AB2I (+AB2I,WA2IID,WA2WX,N2VY,KB2SSS,
N2B2P,W2CJ,N2SFF,K2AGL)
74,025 618 105 L ABDE

NYC-Long Island

N2GHR 31,837 232 79 S ABD9E
N2BT 8,060 205 26 S B
N2YUS 4,820 119 30 BD
WA2ZFH 3,610 79 30 S ABCDE
N2OHS 2,448 81 24 ABD
N2VT 1,152 94 12 BC
N2FRC 1,000 46 11 S B
KF2FX 495 45 11 S B
WB2AMU 988 52 19 Q AB

Northern New Jersey

N2CEI 225,862 700 221 S ABCD9EFGHIJ
WB2WVI 34,114 346 74 S ABCD
WB2VVV 23,458 199 74 S ABCD9EF
N2MH 13,428 285 36 S BCD
K2KIB 12,084 168 57 ABCD
WB2OOQ 9,472 311 S B
WB2CUT 4,550 182 25 S B
N2LMU 3,610 151 19 ABD
WA2BKN 2,784 92 29 ABD
WA2ASG 533 41 13 S A
WB2MBM 508 46 11 S B
KB2S1G 385 53 7 BD
W2JEK 370 37 10 S AB
KE3PL 312 26 12 S A
W2VLF 304 38 8 S B
K6ZMH 80 30 21 S B
K2AVXW 30 10 3 S B
N2WM (+K2BM,K2BJG,KA2AEV,K2LHH,N2HEB,
N2HMM,N2TJT)
192,010 854 182 M ABCD9EF
K2BAR (N2GT,WA2NW,WA2HL,K2JUA,KB2WKJ,
W2UC,KB2YJ,N2DSY,K2CAQO,N2BPR,
K2BJBT,N2PBY,N2NF,WA2LXE,N2PRJ,N2PPS,ops)
105,183 687 117 M ABCD9EP
NX2Q (+K1QQ,N2QBR,WA2SEI)
7,527 185 39 M ABDE

Northern New York

KB2ZVP 45,045 414 105 S ABD
WA2AEY 19,575 225 87 S AB
N2TW 840 32 20 S AB
WB2KLD (+KB2KDP)
6,084 110 52 L ABD

Southern New Jersey

N2SCJ 24,384 280 64 S ABCDE
WA2ONK 19,266 209 57 BD9E
K2AMIN 2,800 112 25 S B
K2DKS 2,378 68 29 ABCD
K2VB 1,428 67 21 ABCD
N2MPU 290 35 12 S AB
W2MMD (K2JF,W2NM,N2WUP,KB2VXC,KA2FFS,
K2CAOC,ops)
20,440 261 73 L ABD

Western New York

K2AN 50,856 303 104 S ABCD9EFG
AA2GF 21,588 180 86 S ABCDE
KB2YUW 7,280 130 52 S ABD
W2WGL 3,456 75 36 S BD
WA2ZNC 1,690 53 26 ABCDE
KB2NFS 1,391 78 13 S BCD
K2OEQ 1,026 44 18 S ABCD
KB2YVC 943 23 S A
N31JD 80 50 10 BD
AF2K 672 32 21 S A
WB2WPM 630 35 18 S AB
NA2X 492 41 12 S B
KB2GVH 376 35 8 BD
W9KX 198 18 11 S B
KB2ZNW 1,764 70 21 Q ABD
K2TXB (+W2DRZ,N2ODU,N2XTX,W2UCZ)
319,784 879 284 M ABCD9E
N2YB (+N2ODK,N2JQR,W3AGB)
297,909 821 237 M ABCD9EFGHIJ
N2HLT (+K2BDM,NS9E,KB2PVZ,KC2ATB,N2HQW)
175,216 712 188 L ABD
W2SAG (N2MES,AI2I,N2PBY,N2PBX,KB2VKL,
N2RHL,WA2RKP,KB2RLO,WA2CPH,AA2JI,
N2WUT,ops)
60,030 385 138 L ABD
KB2SGX (+N2JV,KB2UDV,KB2SGY)
12,558 163 69 L ABD

3

Delaware

W3OR 171,193 599 197 S ABCD9EFG
KB3PD 2,236 68 26 S BD

Eastern Pennsylvania

KB3BI 27,630 193 90 S ABCD9E
WA4GPM 8,268 107 53 S ABDE
KJ3T 5,983 139 31 S B
KE3QY 5,866 93 46 S ABCD
N3JNX 3,737 87 37 S B
WA3CSP 2,625 75 35 S A

N3T8B 2,240 80 28 S AB
N3TLJ 1,079 71 13 S ABD
N3KRE 410 37 10 S BD
N3QSO 390 26 13 S BD
W3UQC 80 16 5 B
W3AWA 65 10 5 S ABCD
K3AN 192 32 6 Q B
WA3WUL 85 17 5 Q A
K3MHO (AI3M,K3JFL,K3MML,K3RA,N3EYB,
N3KMM,N3KTY,W2EOS,W3GHR,W3T,ops)
936,018 2002 349 M ABCD9EFG
W3CCX (AA3GN,WA3NUP,W3KM,WA3AXV,W2SJ,
W2SK,WA3RLT,WA1YHO,K3MFI,K2UT,N3EXA,
N3TNR,N3EYB,W3UQC,N3ITT,N3OZO,WB3JVO,
W3GAD,WA3YUE,ops)
721,413 1618 297 M ABCD9EFGHIJ
K3YTL (WA1MKE,K2LNS,KA3EEO,KA3ZHT,KB3OI,
KE3OA,K3MKZ,K3TOW,N3PBH,N3RN,N3TDE,
N3TKR,N3VIA,N3YV,N3ZPE,W3DZH,WA3JWP,
WA3NVS,WB3JKQ,ops)
601,529 1452 293 M ABCD9EFGHIJ
N3ADC (+KA2PRK,KA1AOR)
21,450 235 66 M ABCD9E
K3UZY (+W2KVI)
19,525 355 55 L B
K3IR (N3TLP,N3PTT,N3TJ,N3UE,N2DYK,N3TUQ,
KB3BGS,KC3LE,ops)
6,946 133 46 L ABD
AD3L (K3EVQ,KE3WP,N3JY,N3JVP,ops)
4,850 86 50 L ABD

Maryland-DC

K1RZ 243,698 808 206 S ABCD9EF
WB2DNE 109,740 474 155 S ABCD9E
N3OPM 15,557 245 47 S BD
WA4VHF 6,006 72 26 S EF
W1T 3,317 90 31 S ABCDE
WB2BZR/3 2,576 70 28 S ABCD
KA3TGC 2,349 73 27 ABD
W3EJH 1,357 57 23 ABD
N3BWJ 1,122 51 22 S AB
WA3EOQ 1,122 51 22 S AB
W3GN 1,100 50 22 S AB
K3JUA 602 43 14 S B
N3ZK 312 39 8 S B
N3YHC 288 36 8 S B
N3VOP 260 40 5 S BD
W3PO 160 20 8 S A
WBTL3 58,788 219 142 Q ABCD9E
W3IP (+K3HH,N3CBJ,N3FNE,N6GBP,N3O,
WA3TID,W3GR3)
162,900 614 180 M ABCD9EF
N3OI 33,152 220 112 S ABDE
N3FYD 27,075 212 95 S ABCDE
N3XEG 11,937 173 69 S A
KA3SDP 10,208 134 58 S ABD
AA3GM 5,734 61 47 ABCDE
N3PUR 5,698 154 37 S B
N3YBC 5,508 102 51 S ABCD
WA3LTB 3,399 103 33 S B
W3KJM 312 24 13 S A
W3ZA 63 9 7 S B
KB3AFT 1,560 50 30 Q ABD
W8J 20 5 4 Q AB
WB8IWG/3 2 2 1 Q B
K3MJW (KA3JWJ,N3MRU,N3NOS,N3OEX,
N3WCR,ops)
16,296 175 84 L ABD

Western Pennsylvania

N3OI 33,152 220 112 S ABDE
N3FYD 27,075 212 95 S ABCDE
N3XEG 11,937 173 69 S A
KA3SDP 10,208 134 58 S ABD
AA3GM 5,734 61 47 ABCDE
N3PUR 5,698 154 37 S B
N3YBC 5,508 102 51 S ABCD
WA3LTB 3,399 103 33 S B
W3KJM 312 24 13 S A
W3ZA 63 9 7 S B
KB3AFT 1,560 50 30 Q ABD
W8J 20 5 4 Q AB
WB8IWG/3 2 2 1 Q B
K3MJW (KA3JWJ,N3MRU,N3NOS,N3OEX,
N3WCR,ops)
16,296 175 84 L ABD

4

Alabama

KE4FRZ 11,725 147 67 S ABCD
KT4DU 656 38 16 S ABD
NA4HJ 448 28 16 S A
KD4ZO 315 21 15 S AB

Georgia

KD4HLG 35,616 271 106 S ABCD
WA2PG 3,400 62 31 S ABCDEF
K6EID 2,574 66 39 S B
KD4K 756 38 18 S ABCD
N0MMA/4 40 10 4 S B
K4BAI 25 5 5 S B
WANH (AE6E,K4KAZ,KE4ZOD,KF4EOI,N9KHC,
NA3T,NX9O,WA4IOB,WA4XXY,ops)
52,040 406 141 L ABDE
WACMA (AD4AS,AE4QC,K4AEK,KA5WZY,
KE4DYX,KF4NOH,W4N2J,WA4DYD,ops)
14,973 188 99 L ABDE

Kentucky

WA4FVQ 12,859 124 77 S ABCD9E
N4JK 10,080 137 72 S ABD
K4JGS 5,096 90 52 S ABD
KE4WDZ 3,075 75 41 S A
KD4GNC 1,540 21 10 S B
WN9DDV 286 22 13 S A
KT4JZ (WD4FI,N4GXE,KE4RPR,NAKEP,KF4FVO,
KF4FVR,KE4NEO,KF4NFD,W6HDM,KC5GAX,
KF4PCA,ops)
32,318 246 113 L ABDE

North Carolina

WA4VH 19,845 145 81 S BDEFG
NA4UP 9,150 140 61 S ABD
W4F5O 4,087 77 49 S ABCD
AA4NC 3,268 76 43 S AB
KB4QQJ 1,225 49 25 S A
N4PH 589 31 19 S A
N4ZWQ (+NG4C,W4C)
23,474 206 97 L ABCD
NA2AK (+KD4OFG)
858 39 22 L AB

Northern Florida

KT4AL 20,381 179 89 S ABDE
KQ4PI 7,638 100 57 S ABCDE
W4UE 7,552 103 64 S ABCD
KB9KH 7,210 102 70 ABD
KE4LV 5,888 92 64 S B
KE4YU 5,764 114 44 S ABD
WD4FAB 2,632 61 28 S BDE

South Carolina

KR4QO 26,136 229 99 S ABD
KD4DVB 5,499 100 47 S ABCD
KE4HGD 4,429 103 43 S A
N4IQ 3,872 84 44 S ABD
AC4Q 2,144 57 32 ABCD
KD4ZMR (+KD4TCA,KD4TCB,KA4ABW,KE4JNY,
KF4HIW)
17,250 202 75 L ABD
W24SC (+ops)
11,968 183 64 L ABD

Southern Florida

WD4MGB 35,305 292 115 S ABD
K2OY 17,633 226 77 S ABD
K9HUY 13,680 182 74 S ABD
N3RTH 11,194 141 58 S ABCDE
K4NB 9,295 146 55 S ABD
W3ZR 1,400 46 25 S ABCD
N5PIP (+N3RQJ)
7,009 132 43 L ABCD

KD4LXB (+KD4VBI)

3,740 84 44 L ABD
Tennessee
N8UM 103,713 454 181 S ABCD9E
NS4W 41,114 280 122 S ABCD
KE4JLE 9,348 157 57 S ABD
WB4ZUG 8,866 130 62 S ABD
K4RG 6,192 128 64 S B
KB4WUT 7,105 145 49 S A
KD4HIK 7,093 149 41 S ABD
AD4F 3,922 92 37 S ABD
N4LGY 2,310 66 30 S BCD
NA4US 1,270 38 31 S ABD
NA4JQ 324 20 12 S ABD
WG4G 135 14 9 S ABD
WB4FB (WB2NHQ,KD4GCF,KM4KQ,KF4NLR,
KF4NJJ,ops)
21,004 207 89 L ABCD
N7AL (KQ4TV,KB4IDC,ops)
7,598 112 58 L ABCD
KF4PAF (+KE4ONB,KF4NUX)
952 62 14 L ABD

Virginia

N4KWX 58,295 328 131 S ABCDE
KH2CY 36,975 300 87 S ABCDE
KD4JRF 34,300 233 100 S ABCDE
N4HB 21,298 70 82 S ABCD9E
AD4DG 20,461 183 79 S ABCD9E
K9OYD/4 18,326 141 77 S ABCD9E
KD4EAO 10,773 131 57 S ABCD9E
K4FTO 10,123 158 53 S ABD
KN4SM 7,308 105 58 S ABD
N4ZJ 5,724 98 54 S ABD
KC4WU 5,696 131 32 S BCD
W4LTJ 3,293 89 37 S A
AD4TU 2,759 89 31 S AB
N4BG 2,583 69 37 S ABD
K4IQ 1,891 61 31 S B
K4UO 1,674 62 27 S B
KE4WFO 1,196 46 23 S ABD
W4KK 560 40 14 S B
K1NV 518 37 14 A
K4ME 490 35 14 S B
N4MM 364 28 13 S AB
WA4QDM 315 21 15 S AB
KF4QDA 16 4 1 Q B
KE4VCS 574 41 1 Q B
W4IY (W4NF,W4RM,W4AD,K4AKI,W4DC,W4CE,
K4ARR,K5OF,WA0DY,KT4AD,K4RG,N1TXI,
W4DAV,N3DAN,N4MPI,N4DXS,N8NEV,ops)
565,740 1377 315 M ABCD9EFG
AD4HG (VE2HX,KC4ZCE,KC4ZTD,KE4UHH,
W4PGL,KB4TZS,ops)
9,106 157 58 L AB

5

Arkansas

W5ZN 288,320 627 272 S ABCD9EFGHI
N5TNM 140 14 10 S A
N5OEO (+KA0NNO)
14,507 152 89 L ABCD

Louisiana

W5FYZ 1,180 59 20 S B
KB4QGO 972 36 27 S AB
K5CQ 475 23 19 S AB
N5MYH (+K05AOU)
1,377 42 27 L ABD

Mississippi

K5LUY 49 7 7 S A
K5CWC (+K5SWCP)
3,360 80 40 L ABD
KV4T (+K54YT)
1,452 44 33 L AB

New Mexico

K5AM 31,440 229 131 S ABCD
K5RHR 4,600 85 40 S ABCD
W5DQ 2,898 42 22 S ABD
N5XZM 2,464 69 28 S ABCDE
KB5ZSK 585 28 15 S ABCD
W5SDJ 1,914 50 33 Q ABCD
KB5TJ (+N5OBA,K5CNZR)
2,898 66 36 L ABD

North Texas

W8CM 31,722 267 102 S ABCD9E
W5DK 15,124 199 78 S A
W5TKU 12,276 136 62 S ABDEFH
W5VKS 10,752 168 56 S ABCD
AA5C 9,750 97 50 S ABCD9EFGHI
K5YT 5,350 85 50 S ABCD
KA5BOU 5,332 94 43 S ABCD9E
K5YN 5,151 101 51 S ABD
K6K6I 4,800 160 30 S B
W5KQJ 2,325 61 31 S ABD
N5KB 897 39 23 S AB
N9MK (+K5SVQ)
16,350 175 75 M ABCD9
N5VBK (+K5BVP)
6,424 118 44 L ABD

Oklahoma

N5TML 40,504 285 122 S ABD
KA5WRG 7,080 116 60 S ABD
W5WAX 4,032 63 48 S ABCDE
K5SUGX 1,160 40 29 S AB

South Texas

N5HHS 86,880 506 160 S ABD
W3XO/5 39,060 264 124 S ABCD9E
K5VH 25,790 234 95 S ABD
W5UW 20,592 207 88 S ABCD
KB5ZFO 10,440 174 60 S A
N5BA 9,168 153 48 S ABCD
W5EHM (KMSFA,ops)
4,456 107 44 S ABD
W5OZI 3,780 80 47 S AB
K5K5A 779 37 19 S ABD
N5LZ 225 25 9 S B
KB5LJ (+W5DX,K5SBAK)
82,592 454 152 M ABCD9E
N5WS (+K5SUK,N5ZJ)
66,129 392 141 M ABCD9E
W5KFT (+K5TR)
9,224 474 176 L ABCD

West Texas

W5AL 23,647 171 107 S ABCDE
K5K1H (+K5SKK)
36,025 225 131 M ABCDE
K5SKOF (+K5SOBX,K5HNI,K5CSQV,K5COGT,
K5SRWK)
6,480 100 80 L ABD

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East Bay

W5SOMF 37,674 311 78 S ABCDE
N6OIK 3,450 106 23 S BDE
N6EIO 3,174 106 23 S BCD
KQ6DI 1,144 52 11 S C
KF6GYM 884 69 13 S C
KF6BAN 42 7 3 C

Los Angeles

KE6HPZ 23,920 339 52 S ABCD
AC6TA 10,728 231 36 S ABD
KE6GCT 10,535 174 49 S ABCD
WB6ST 10,168 177 41 S ABD
N6KN 10,028 174 46 S ABCD
KL6MN 6,125 175 35 S AB
KE6MA 5,336 166 23 S ABCDE
KE6AXJ 4,640 194 16 S BCD
K6CML 4,180 178 41 S ABCD
KE6JLF 2,620 103 20 S BCD
KE6MAK 1,778 99 14 S ABD
AC6EN 1,734 90 17 S ABD
KE6FVN 1,504 68 16 S ABCD
KF6FJG 1,414 68 16 S ABD
K6GZH 938 49 14 S BDE
W6EZB 595 85 7 S B
KF6EOJ 252 32 6 S BD
KE6VU 216 23 8 S ABD
WB6C 210 35 22 S ABD
KN6JN 160 14 8 S BCD
N6JO 12,430 170 55 Q ABD
K6DRMS 4,092 128 22 Q ABCDE
WB2DHH (+K6KZW,N6RMJ,N6ZE,W6YLZ,
W6DJS)
201,790 884 170 L ABCD
W3SE (+N6OPR,K6GBS)
76,167 629 93 L ABCD
WA9STI/6 (+W6BFGW)
16,376 263 46 L ABDE

Orange

N6HKF 31,372 258 92 S ABCD
K6GEG 30,780 281 76 S ABCD
KE6SWL 14,100 155 50 S ABD
N6DN 9,400 152 50 S ABD
K6TSK 9,184 160 41 S BD
K6B1Y 7,998 116 43 S ABCD
K6BUIX 3,570 105 34 S AB
KN6BR 2,804 93 28 S B
K6JHZ 639 71 9 S B
KE6QCB 210 25 7 S BD
KA6PU 203 25 7 S BDE
KF6CR 104 13 8 S B
W6ZO 13,288 224 44 Q ABCDE
KE6GFF 4,004 154 13 Q D
KE6GF 2,580 143 12 Q BD
KE6WOX 100 20 5 Q A

Santa Barbara

N6PI 24,219 263 69 S ABCDE
KE6RCI 984 82 12 S B
WB6AG (+W6FM,W6BPJ)
34,532 310 89 L ABCD

Santa Clara Valley

K6FV 8,528 176 41 S ABCD
AB6SO 6,931 154 29 S ABCDE
WB6LRV 4,475 107 36 S ABD
N6ES 3,690 123 30 S A
AJ6T 3,424 87 32 S ABEP
WB6EPV 2,732 110 19 S ABD
K6FRM 2,091 74 17 S ABCDE
W7LVQ 1,710 66 12 S B
K6GAO 552 46 12 S AB
K6BII 546 31 13 S BD
KE6EFO 312 26 12 S AB
WB6MT (WB6T,WB6T,WB6E,W1AX,WB6FSE,
K0VQR,K6QZW,K6RKH,K6HFA,ops)
554,310 764 130 M ABCD9EFG
WA5YWC (+K6CTE,U,K6GNBC,K6CBWO)
74,354 555 94 M ABCDE
K6APR (KF6DDT,KF6SDT,K6BHM,KF6HNI,
K6BHB,K6BAP,K6BQ,K6BQ,K6BQ,K6BQ,
K6BQV,K6GNK,K6Q,K6BONP,K6CUCN,N6VYT,
KE6WFF,KE6WLW,KE6YDG,KE6YIV,KE6YIV,
N6ZGY,ops)
61,952 497 88 M ABCDE
K6PUD (+K6CSBJ,K6CZT)
21,114 303 51 L ABDE

Santa Diego

K6FBJB 4,445 109 35 S ABD
K6BPMW 1,277 107 35 S ABD
K6BIA 444 35 12 S ABD
WB6AXW 160 15 8 S AC
KE6NRO 576 32 18 Q ABD
WB6YJ 275 17 9 Q BDI
WB6Q (+K6CND,K6JNB)
22,495 329 55 M ABCDE
WB6DTA (+ops)
17,700 185 75 M ABCDE
WA6TBO (+K6MYC,K6BMY,W6BCCYS,KF6FXM)
93,240 596 126 L ABCD

San Francisco

WN6W 8,618 163 31 S ADE
K2YIC 870 36 15 S BD
WA6JYU 770 24 12 S ABD
K6PZB 294 21 14 S AB
K6WC (WB6NUS,WA6OEM,K6B0FY,N5EUG,
KE6MYW)
28,416 314 64 L ABDE

San Joaquin Valley

N6NB 65,331 409 119 S ABCDE
N7STU 25,575 239 75 S ABD
N6AJ 23,616 214 72 S ABD
N6PVY 23,634 211 79 S ABCDE
KB6VW 14,535 255 57 S ABD
K6KY 10,206 189 42 S ABD
N6IFW 9,648 158 48 S ABD
N6IG 9,315 166 45 S ABD
K6BIC

WA7JTM	12,474	145	77	S	ABD
KF7JS	1,188	40	22	S	ABD
WB7OHF	1,082	54	18	S	ABD
WB7OIC	722	38	19	S	B
N8MA	584	30	18	S	BD
N7TX	252	36	7	S	A
KF7NP (+N8UI)	15,996	162	86	L	ABCD
KE7FC (+K8C8C,N7GJD)	13,246	162	74	L	ABD
N7SQN (+K7KJL)	7,920	136	48	L	ABDE
Eastern Washington					
N7AU	16,016	158	77	S	ABCD
AB7IZ	8,442	116	67	S	ABD
N7YAP	6,032	91	58	S	ABD
N3CEV	4,515	77	43	S	ABD9EG
W7PQE	1,798	58	31	S	ABD
K7XW (+W7FHJ)	45,875	273	125	M	ABCD9EP
K7CW (+K7KYK)	29,988	223	119	L	ABDE
K7TJ (K7JRN,W57L,ops)	4,185	75	45	L	ABD
Idaho					
KD7HY	8,320	98	64	S	ABDE
KY7GUX	6,466	94	61	S	ABD
W7ID	4,158	65	42	S	ABDE
KC7LJ	3,332	68	49	S	AB
WA8CLK (+W06HDY,KD6LTB)	29,614	189	134	M	ABCD
WA0DYU (+K7MLM)	9,849	120	67	L	ABC
N7LT (+K7CH7C)	9,100	132	65	L	ABD
KJ7TH (+K7KAT)	5,280	107	40	L	ABD
Montana					
WA7PDC	3,225	71	43	S	ABD
W7TCK (KAT7YA,KB7SYO,KC7ZIM,ops)	589	29	19	L	ABD
Nevada					
K7ICW	17,484	148	94	S	ABCD
NW7O	6,710	92	61	S	ABCD
N7LQ (+K7ZUI,FP7GM,K7OVD,ROGER,TR4VIS, WAGMNM)	50,274	311	133	M	ABD
Oregon					
W7EW	30,081	241	111	S	ABCD
N7ELJ	16,686	190	81	S	ABD
N7DB	14,400	169	80	S	ABCD
N7YAG	9,870	161	47	S	ABCD9E
KAT7MF	3,075	63	41	S	ABD
W7PLA	2,356	54	31	S	ABD
K7HJ	2,052	58	27	S	ABCD
K7W	1,104	48	23	S	B
K6ZX	432	27	16	S	B
WB7TSO	96	16	6	S	B
KG7FJ	84	11	7	S	B
W7IY (+WB6FFC)	29,046	235	103	L	ABDE
Utah					
K8LNP	5,082	100	42	S	ABCD
NJ7A	3,074	80	29	S	ABDE
WA7HQD	1,312	41	32	S	A
K7CQD	243	23	9	S	ABD
WA0YFL	30	6	5	S	ABD
Western Washington					
W7FI	11,174	151	74	S	ABD
KW7R	3,120	92	26	S	ABD
K7EY	3,016	77	26	S	ABCD9EF
K8JUK	1,540	59	20	S	ABCD
K7VHF (K7ND,KD7TS,K7CAN,N7UZ,W7Z,ops)	90,156	469	132	M	ABCD9EFGI
N7EPD (+W7L7E)	29,094	324	78	L	ABD
W7DG (N3EG,K7JXX,K7AD0,N7UD,ops)	1,220	53	20	L	ABD
Wyoming					
K17W	4,173	107	39	S	A
WA7KYM	1,278	39	18	S	BCDE
8					
Michigan					
K2YAZ	101,752	385	184	S	ABCD9EF
K8MD	69,080	329	157	S	ABCD9E
WZ8T	48,384	286	128	S	ABCD9E
N8CGY	13,120	138	82	S	ABCD
N14RS	11,440	156	63	S	ABCD
K8NFT	4,687	96	43	S	ABD
K8BU	4,488	102	44	S	A
K8BVRU	4,108	79	52	S	ABD
W8DKUF	4,029	72	51	S	ABD
K8BMC	3,682	71	52	S	ABD
K8PT	3,276	78	42	S	A
N8ZVB	2,205	63	35	S	ABD
N8YAM	1,248	52	24	S	ABD
K8ZFF	720	29	20	S	BD
W8M (KC8DAZ,N8BI,WA8VPD,ops)	150,400	435	188	M	ABCD9EFGH
KU8Y (+N8QA,KX9X)	156,004	695	188	L	ABCD
K8EB (+K8PZ,K8S8T,KF8QL,N1NB0)	102,834	491	174	L	ABCD
N8PVT (+K8CALA)	14,938	173	77	L	ABD
WA8RLI (KB8ZAU,N8OEO,N8XQF,ops)	10,324	152	58	L	ABCD
N8EDV (+K8B9Q)	7,685	145	53	L	A
W8VPD (+K8NTK,K8IQY)	4,343	87	43	L	ABD
Ohio					
WA8WZG	395,031	838	273	S	ABCD9EFGHI
K8ED	160,160	502	208	S	ABCD9E
K8TQK	107,100	382	180	S	ABCD9E
K8MR	49,323	297	123	S	ABCD
A8AQ	46,800	336	117	S	ABD
W8MM	34,438	227	134	S	ABD
KE8RO	30,846	239	106	S	ABD
N8ZJN	30,411	202	109	S	ABCD
W1AJR	19,497	163	77	S	ABDE
WA8RU	19,012	164	98	S	ABCD9
K8CSD	18,343	181	83	S	ABC
K8BYR	6,534	103	54	S	ABD
N8AO	5,900	125	44	S	B
K8BUH	5,160	101	43	S	ABD
K8BUJ	3,080	85	36	S	ABD
W1FEZ	2,937	75	33	S	BD
N8VEA	2,403	73	27	S	ABD
N8YSF	2,088	58	36	S	ABD
N8CCC	1,208	39	31	S	A
N8XA	1,180	130	51	S	ABCD9E
N8LGP	1,474	67	22	S	B

K8NRC	756	35	21	Q	ABD	
W8ULC (+K8SSB,W8LR,W8Z,AA8HH)	216,726	723	246	L	ABCD	
K18CA (N8MWK,N8UVM,KC8FXL,KC8FB)	KC8HL,K8BPU,K8BYX,K8BYX,W8LWC, K8LKG,KC8BU,K8BUJ,ops)	20,928	191	96	L	ABDE
KC8HLK (+K8WV)	3,237	83	39	L	A	
West Virginia						
K2UOP/8	117,025	459	155	S	ABCD9EF	
N8XUR	26,496	224	92	S	ABCD	
K8UC	16,247	145	77	S	ABCD	
W8GT	7,462	106	58	S	ABD	
N3WJ	1,378	53	26	S	ABD	
WN3C	1,071	40	21	S	BD	
WB8EL	540	30	18	S	A	
K8GP (W8DISK,W3ZZ,K1HTV,K3SX,K6LEW,ops)	547,143	1367	331	L	ABCD	

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Illinois					
W9IU	87,450	435	159	S	ABCD
WD9EXD	79,032	358	178	S	ABCD
KA9CFD	45,292	276	134	S	ABCD
N9WRO	30,500	200	95	S	ABCD9E
W9RM	30,380	263	110	S	ABCD
N9WVK	28,416	256	111	S	AB
K9EFL	13,651	155	71	S	ABD
N9TNY	8,619	132	51	S	ABD
K9SB	6,672	105	48	S	BD
WD9ISG	5,883	125	37	S	BD
K9OM	5,546	118	47	S	A
K9GJC	5,334	127	42	S	AB
W9VA	3,990	105	38	S	A
N9TOK	3,920	117	28	S	ABD
N9WVK	3,760	93	40	S	ABD
N9WVTF	3,570	103	34	S	B
K9MLA	2,470	95	28	S	B
K9BIL	2,075	71	25	S	ABD
K9BIL	1,898	65	26	S	ABC
WB9GKA	1,560	55	26	S	ABCD
N9LCH	924	44	21	S	E
N9TZO	925	32	15	S	ABD
N9TZZ	7,656	123	58	Q	ABD
AA9D (+N9KC,K9PW,K9VY,K9JK,AA9IL, WB9EEA,N9OGU,N9THC,AA9UK,W8D8HE, N8WVK)	790,641	1376	387	M	ABCD9EFGHIJK
N9LAG (+N9QZC,N9KJ,K9QZC,K9BQKL,K9BQQF)	163,850	795	145	L	ABCD
K9BNR (+N9WFO,N9LZG)	4,320	102	36	L	ABD
Indiana					
KA9OFL	42,375	226	113	S	ABCD
AA9LT	19,747	201	91	S	ABCD
K8B9FZQ	10,804	112	74	S	ABCD
N8LUX	9,408	138	56	S	ABD
WB8YFE	7,076	103	61	S	ABD
N9RZY	5,350	107	50	S	AB
W9DZ	4,816	93	43	S	ABD
WB9SPT	4,524	97	39	S	BD
WB9BDR	4,100	70	50	S	ABCD
N9KZJ	3,950	70	30	S	ABD
K8NRM	3,502	103	34	S	B
W9EVS	2,520	57	30	S	ABDE
KD8RXT	1,950	64	30	S	ABD
K8NMA	950	36	25	S	ABD
K8NOMW	243	27	9	S	B
WB8ERB (+N8NGO,K9LZJ,K9YDO,N9ARQ, WB9YCZ, KA9BFM,N9QQY,K8BNWP)	98,464	430	181	L	ABCD
Wisconsin					
AA9AO	61,017	349	129	S	ABCD9E
W9FX	57,912	325	127	S	ABCD
N9JR	29,520	255	90	S	ABCD
W9JN	26,585	205	105	S	ABCD
N9PBA	17,756	181	92	S	ABCD
N9DG	9,384	126	68	S	ABD
WA9LZM	8,855	161	55	S	AB
W9PHJ	7,367	121	53	S	ABD
K9FYZ	5,004	139	36	S	ABD
KD9TH	4,760	89	40	S	BD
N9UBS	4,214	86	49	S	AB
K8JIF	3,762	114	33	S	AB
ND9Z	3,360	70	42	S	ABD
WA1JUU/9	3,024	108	28	S	B
N9LAD	2,310	53	33	S	ABCD
WA9HCZ	2,196	52	36	S	ABD
KA9JCP	2,139	63	31	S	ABCD
AA9PC	1,674	62	27	S	AB
W9NWK	1,593	59	27	S	AB
K89OFI	1,575	65	25	S	B
KF9YR	675	27	25	S	AB
W9YCV	330	20	15	S	ABD
N9NCF	322	20	14	S	ABD
N9NDP	290	20	10	S	AB
W9KWH	262	21	12	S	AB
WD9IAB	405	27	15	Q	A
W0UC (+W0UHU,K0GJK,N0AKC,N0BSH,N0LJ, N9PPE,K89EO)	245,180	829	260	L	ABCD
N9SE (+WB9UAI,KA9WXX,N9FH)	44,298	333	107	L	ABCD
K89QWK (+W9B9GA)	1,860	48	31	L	ABD

0					
Colorado					
K0GU	50,083	309	157	S	ABCD
N0SVW	4,480	122	28	S	BD
N0UCY	2,576	75	23	S	ABDE
KA0BAD	1,900	50	38	S	A
N0FCV	7	7	1	S	B
N0IVN	13,462	186	53	Q	ABCD
K0LS	280	33	7	Q	BD
W1XE (+N0KE)	76,038	375	174	L	ABCD
N0POH (+K0BYRX)	5,146	129	31	L	ABCD
Iowa					
K0MQS	11,151	189	59	S	B
NE0P	2,432	62	38	S	ABD
KD0BT	2,077	57	31	S	ABD
N0SRP	925	33	22	S	A
K8OCOM	726	12	9	S	ABD
K0EHL	117	12	9	S	ABD
N0AC (+N0NI,N0MI,WA0ETC)	44,800	290	140	L	ABDE
N0MA (N0LNO,K0DAS,K0SKX,N0YVY,N0WLY, K0VAR,ops)	34,656	288	114	L	ABD
Kansas					
N0LL	64,255	300	181	S	ABCD
W0Q0	56,940	272	146	S	ABCD9EHI
W0EKC	17,654	146	91	S	ABCD
K80TJ	6,171	102	51	S	ABD

N0JK	5,978	96	61	S	ABD
N0LIE	4,872	103	42	S	BC
W0RT	2,808	65	36	S	ABD
K8OPGJ	1,512	56	27	S	AB
W8QNX	552	28	7	Q	BD
N0YKR (+K0FFC,K0KGC,N0QMO,K8OUKR,W8ZNC)	24,198	172	111	M	ABCD
KC0AHN (K80YHU,KC0BFA,K80YHT,K80YWM, K80OPH,N5CLLO,ops)	10,904	139	58	L	ABDE
KA0KAN (+K80YVF,K80YER)	1,972	57	34	L	ABD
WY0C (+K80PHS)	12	4	3	L	AB
Minnesota					
W80BWE	54,404	365	116	S	ABCD9EFGH
W82HF1/0	24,948	258	81	S	ABCD9E
K80VUK	23,751	230	87	S	ABD
W80JLC	8,832	149	48	S	ABDE
K80BG	8,480	156	47	S	ABD
W0CEPZ	6,975	133	45	S	ABD
N0SRQ	5,670	84	63	S	ABD
W80RLY	2,442	58	37	S	ABCD
K80JLY	2,258	162	14	S	B
N0QVQ	2,257	52	37	S	ABD
K80TZA	1,920	73	20	S	ABCD
KA0PQW	1,653	49	29	S	ABCD
K80OBT	200	29	5	S	BD
W82Q (+W82PHW,W80BGM,K0P,J,KI0GU,N0HJZ)	22,919	709	237	M	ABCD9EFGI
N0UK (+K80AYVB)	8,142	105	59	M	ABCD9E
K80PYO (+K80IKP)	40,870	295	122	L	ABCD
Missouri					
K0TLM	8,875	108	71	S	ABCD
W0JRP	4,895	76	55	S	ABCD
N0SIN	4,366	129	34	S	B
K80RPL	2,685	55	49	S	AB
N0KXS	1,312	41	32	S	A
K80SWK	2,170	62	35	L	AB
North Dakota					
NT0V	19,740	202	94	S	ABCD E
Nebraska					
N8KJG	27,392	214	128	S	A
AN9K	1,230	41	30	S	AB
N0WJY	936	39	24	S	AB
South Dakota					
KE6SG	7,36	40	16	S	ABD
W7XU (W80SD,N0QJN,W7XU,ops)	72,581	388	181	L	ABCD
WV0H (+W80OAJ)	24,725	211	115	L	ABCD
Nova Scotia					
W3EP/V01	2,077	67	31	S	A
VE1JAY	12	4	3	S	A
Quebec					
VE2PJJ	3,200	90	32	S	ABD
VE2LC	2,380	58	34	S	ABCD E
VE2YAT	1,920	80	32	S	AB
VE2AWR	936	36	25	S	B
VE2SHW	162	54	3	S	B
VE2VLJ	60	15	4	S	B
VE2JWH (+VE2GUQJ)	10,176	159	64	L	ABD
Ontario					
VE3AX	72,842	339	154	S	ABCD E
VE3RM	48,784	312	136	S	ABCD
VE3ST	48,484	286	123	S	ABCD
VE3FHU	11,628	132	76	S	ABD
VE3WCB	10,710	116	63	S	ABDE F
VE3QJN	10,098	136	66	S	ABD
VE3SXE	9,261	147	63	S	AB
VE3AEC	6,048	100	50	S	ABD
VE3VHB	1,113	53	21	S	B
VE3URS	480	24	20	S	A
VE3ZY (VE3FFK,ops)	160	20	8	S	B
VE3TMG (+VE30DE)	18,788	212	77	L	ABD
VE3FIN (+VA3TG)	74F	28	22	L	ABD
Manitoba					
VE4RBL	1,980	60	33	S	A
VE4ZK (+VE4KQ)	42,090	366	115	L	AB
Saskatchewan					
VE5FUF	65,274	506	129	S	A
VE5NN (+VE5CMA)	25,398	249	102	M	AB
Alberta					
VE6TA	14,076	144	92	S	ABCD
VE6XT	5,664	93	59	S	ABD
VE6JY (+VE6JY,VE6MK,VE6KV,VE6BMX, VE6DGO)	35,046	275	118	L	ABD
British Columbia					
VE7JY	16,048	193	71	S	ABDE
VE7XO	740	33	22	S	ABD
VE7ASI	630	37	15	S	ABD
VE7SKA (+VE7HCE)	10,759	194	53	L	ABD
VE7WCE (VE7AGG,VE7EAF,VE7NNN,ops)	2,015	64	31	L	ABD
Marine Mobile					
K54KP	1,316	47	28	S	AB
N2MZN (+ops)	2,299	96	19	L	ABD
N30BY (+W82REM,KD2JA,W3ET)	2,233	72	29	L	ABD
Bahamas					
6A1EA (W820,ops)	5,148	99	52	S	AB
Cuba					
CO0FRC (CO2JA,CO2KG,CO2OQ,CO2WW, CO2YU,ops)	3,270	107	30	L	ABCD
Puerto Rico					
WP44NY	28	28	1	S	B
WP4KOE	15	15	1	S	B
Mexico					
XE2/N6XQ	3,321	86	27	S	ABCD E
XE2HWB	114	19	6	S	B
XE2/KC5FMT (+KC5CFMU)	1,600	50	32	L	AB
Hawaii					
KH6HME	576	56	9	S	ABD

By **Billy Lunt, KR1R**
Contest Manager
and
Bev Fernandez, N1NAV
Assistant Contest Manager

1997 ARRL August UHF Contest Results

August is a prime time for vacations, picnics, running along the beach, sunbathing, and other enjoyable pursuits. Falling right smack in the middle of all of these leisure activities, you'll find the August UHF Contest—always the first full weekend in August. In most corners of the world, you'll find folks resting and relaxing—but not UHF fanatics. They spend their weekends heading to their favorite mountaintop or sitting in a hot radio shack breathing stale air. Their blood really gets pumping when a band opening occurs. In fact, there is nothing more exciting than a contest band opening. Everyone goes crazy—people you never heard before are calling you, new multipliers are rolling in at a rapid rate, and you can hardly keep up with the logging!

During the UHF Contest, we did have some pretty good band openings. Even though some folks didn't notice them, they were there. The best place to be was on 432 MHz. When the band opened, people were making contacts with stations 400 miles or so away. Don't overlook 222 MHz. That's another band that can really pay off in the UHF Contest.

Participation in the UHF Contest has been holding pretty steady over the last few years. This is largely thanks to the participation pin program. We awarded 100 participation pins in the 1997 contest. But pins can't do it alone. If you participate in the

UHF Contest be sure to send your entry to Headquarters to show your support. The total number of entries in this year's contest was down only slightly from last year's total. That's not bad for the UHF Contest. Also, while looking through the entries, we noticed a very interesting and encouraging item—activity on the higher bands is increasing. More people are getting equipment and trying out the microwave bands. Thirty seven stations (26 single operators, 7 rovers, and 4 multioperators) sent in entries for 2304 MHz and higher: 2304 MHz, 37; 3456 MHz, 22; 5760 MHz, 16; 10 GHz, 19; 24 GHz, 5; and 300+ GHz, 1.

This was a "first contest" for many of the participants and most first-timers weren't concentrating on amassing huge point totals; they just wanted to have fun. "I'll be back next year" was a very common quote.

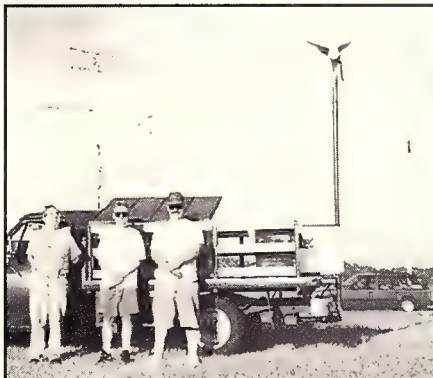
Top Five

Single Operator	Multioperator	Rover
WA8WZG 237,930	W2SZ/1 382,752	WB9SNR 112,407
WW8M 132,549	N2ODK 74,670	K9PW 102,480
K3SIW/9 132,006	WA3UGP 25,200	VE3SMA 49,140
WA2FGK 108,225	NU7Z 15,621	K9JK 26,268
(K2LNS,op)	AA4ZZ 12,300	VE3OIL 17,820
AA2UK 106,215		

Yes, the band openings could have been longer, but we still had some impressive scores. The single operator and rover categories had overall record-breaking scores. New division records were set in 15 divisions (4 single operators, and 11 rovers). The winner in the single operator category, Tom, WA8WZG, set the overall score record at 237,930. Great going Tom! In the rover category, we also had some record breaking scores. Jim, WB9SNR, set a new overall rover record with a score of 112,407 points, 40 thousand more than last year. The crew at W2SZ/1 easily won the multi-operator category from their Mt. Greylock location, scoring 382,752 points. There were some impressive scores in all the categories. Check out the score boxes.

You don't have to have a winning score to submit an entry. Get out there, get on the air, and have a great time. The UHF Contest is an ideal opportunity to get the family together and go camping, or hiking, or whatever. (Just don't tell your spouse you brought your radio along!) It's also a good opportunity to get the kids interested in ham radio. Even if you only make a few contacts, send in your entry. If you don't want to turn in a score, we can use it as a check log.

Find yourself a good location, and make a special effort to get on a "new" band. We need to populate the microwave bands. See you next summer—August 1-2, 1998—for the next ARRL UHF Contest.



Joe, N8HNS, with his team at Fisk Knob Park in Kent County, Michigan. Their solar-powered vehicle is ready to go! They worked 16 grids for a total score of 9120.



Stephanie, KC8ALA, at her portable location overlooking Lake Michigan, found it very hard to keep her mind on the contest. Who wouldn't be distracted with a view like that?



Larry, KB8JUI, has a comfortable seat and is hard at work making contacts. He finished second place in the Roanoke division.

Scores

Each line score lists call sign, score, stations worked, multipliers, and band (C = 222 MHz, D = 432 MHz, 9 = 902 MHz, E = 1296 MHz, F = 2304 MHz, I = 10 GHz, J = 24 GHz, K = 47 GHz, L = 75 GHz, M = 119 GHz, N = 142 GHz, O = 241 GHz, P = 300+ GHz), hours, and ARRL/RAC Section. Call signs of division leaders and band indicators are listed in boldface type.

Atlantic										Midwest										Pacific										Roanoke										Rocky Mountain										Southeastern										Southwestern										Northwestern																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																									
WA2FGK (K2LNS,op) 108,225										W0ZQ 3,600										W2JHO 414										KE7CX 1,280										K4QI 21,948										KB5ZSK 168										WD4MBK 6,816										WS4F 6,789										K6GFF 1,647										K6GFI 846										K6UIH 672										WB5LUA 48,843										WB5ZDP 7,008										WA5TKU 5,688										K5SW 1,539										WA5VKS 1,530										KK5IH (+KK5KJ) 462										W5EHM (K5TR,KD5AAD,KC5QJK,KM5FA,ops) 72										Canada										VA3ST 10,824										VE3WCB 3,036										VA3AEC 540										VE2JWH (+VE2PIJ) 408										WB9SNR 112,407										CEN K9PW 102,480										CEN K9JK 26,268										CEN N8KWX (+KB9II) 5,070										CEN N9VZX 210										CEN N9SFN 168										CEN WA2VOI 5,016										DAK K9DTB 144										GL N1LZC 5,214										NEW N1FGY 1,620										NEW AA7VT 8,190										NW K6GL (+KD6LHL) 1,560										PAK WN6W 108										PAK N0KE 3,135										ROM WB0QGH 1,200										SE N6DN 1,476										SW AD6AF 315										SW N5QGH 12,078										WG VE3SMA (+VE3QIK) 49,140										CAN VE3OIL 17,820										CAN										Checklogs										KB0RLH, W6OAL.																																																																																																													
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Edited by **Steve Ewald, WV1X** • Assistant Field Services Manager

The ARRL Field Organization Forum

Field Organization Abbreviations

ACC	Affiliated Club Coordinator
ARES	Amateur Radio Emergency Service
ASM	Assistant Section Manager
BM	Bulletin Manager
BPL	Brass Pounders League
DEC	District Emergency Coordinator
DXFR	DX Field Representative
EC	Emergency Coordinator
LGL	Local Government Liaison
NCS	Net Control Station
NM	Net Manager
NTS	National Traffic System
OBS	Official Bulletin Station
OES	Official Emergency Station
ORS	Official Relay Station
OO	Official Observer
OOO	Official Observer Coordinator
PBBS	Packet Bulletin Board Station
PIC	Public Information Coordinator
PIO	Public Information Officer
PSHR	Public Service Honor Roll
SGL	State Government Liaison
SEC	Section Emergency Coordinator
SM	Section Manager
STM	Section Traffic Manager
TCC	Transcontinental Corps
TA	Technical Advisor
TC	Technical Coordinator
TS	Technical Specialist
VC	Volunteer Counsel
VCE	Volunteer Consulting Engineer
VE	Volunteer Examiner

volunteers in Lancaster county who have been very active in the TMI and Peach Bottom exercises. The following ECs participated in the annual county ARES evaluation: KF2PM Bucks, KC3XL Chester, KA3PDQ Dauphin, WB3FQY Lancaster, WA3LWR Lackawanna, N3NUV Lycoming, KA3KMH Luzern, N3IRN Montour, W3SJ Monroe, W3EAG Montgomery, W3PYF Northampton, NR3U Snyder, WY3K Schuylkill, K3BM Montgomery, KA3TOV Wyoming, N3GKP York. From 59% of the counties reporting there are 70 OES appointments and 744 active ARES members. 12 hold a Simulated Emergency Test. 8 have their own county ARES traffic net. 4 have NTS liaison and 11 sponsor ARES training sessions. Our thanks to those ECs who took time to send us that information. Our State Government Liaison, W3BKF, is in the process of getting legislation passed that would get free vehicle registration available for ARES/RACES groups who own emergency communications vans, mobiles, trailers etc. If your club or emergency group is interested send us some details about your vehicle and equipment. Best wishes for a happy holiday season from the Section Cabinet members W3FPL, W3KOD, W3DZL, WA3PZO, W3BKF, N3IGA, WY3K, K3TX, W3XV, N3KYZ and SM, W3TI. Tfc: W3KOD 504, N3DRM 274, N3EFW 162, W3HK 145, WN3TH 107, W3VLS 85, NR9K 67, W3IPX 49, WA3EHD 42, N3NNH 34, AD3X 34, W3DP 32, N3HR 28, N3AT 22, W3NNL 21, W3KAG 20, W3JXK 19, N3CSE 17, W3TI 8, K3TX 16, W3ZON 16, W3ADE 10, W3TWW 10, N3AS 8, K3ARR 7, N3DCG 6, KA3LVP 6, WA3CKA 5, W3BNR 4, W3SD 3, W3GCK 2. Tfc Nets: EPA 214, EPAEP&T 155, PTTN 107, PFN 10, D6ARES 13, SCESN 12, EPAS 6, LCARES 5, SEPTN 4, CCAN 4. With the end of the year drawing near, give some thought to sending your holiday greetings via our section traffic nets. An ARRL Sixty One or Sixty Two sent to friend and relatives would be greatly appreciated by them, plus it would boost your traffic count. Here's wishing all a Joyous and Happy Holiday season. Harry, W3KOD, STM.

MARYLAND/DC: SM: Bill Howard, WB3V, 410-551-6775 (wb3v@erols.com)—ACC: Tony Young, WA3YLO 301-262-1917. ASM: Jerry Gavin, NU3D, 410-761-1423 (k2ilq@aol.com). ASM/RACES Coord: Al Nollmeyer, W3YVQ. BM: Al Brown, WA3FYZ, 301-490-3188 (Al.Brown@ix.netcom.com). SEC: Mike Carr, WA1QAA, (bamcc@erols.com) 410-799-0403. STM: Bruce Fleming, N3EGF @ K3HK1, 301-863-6582 (MEGASWOOP@aol.com). TC: Bob Bruninga, WB4APR 410-553-6021 (bruninga@greatlakes.nadn.navy.mil). MDC section Web homepage www.erols.com/wb3v/mdc/. Please visit the MDC home page for all the latest links, information and more nets! This certainly has been an interesting month. While we are all getting ready for holiday festivities, there is one issue on which I would like your comments. It is a very common practice for clubs to invite speakers to live up their meetings. Recently, a couple of our MDC Section volunteers were invited to attend a club meeting, during which they were handled very abusively by some of the attendees. The incident seemed to be very embarrassing for a number of the club members. My question is, what do you think of this type of situation and how do you believe it should be handled during the meeting? PRGE EC KA3PVS for July reported 35 members, 2 net sessions on 145.35 with liaison to BTN, and participation in CAM by ARES members N3KHK, KA3PVS, KA3PVM, W3YD, and Tom Wolff. Vikki reports for August: 36 members, an increase of 1; 2 net sessions on 145.35 with liaison to BTN, and ARES participation in Cycle the BAY for MS. Participants in this Public Service Event, providing emergency communications, were John Hueber, Dave Gossard, Hugh Katz, and Vikki. GARR EC N3KAT reports 12 members. MONT EC K3XO reports that on Saturday September 13, MONT amateurs provided communications for the 6th annual Poolesville Day Bike Ride for Breast Cancer Research. 80 cyclists participated in the 25 mile ride. Communications were provided at the start/finish line, a rest stop and from one SAG wagon. In addition, two mobile units patrolled the course; no injuries were reported. Participating amateurs were N4EOC, N3SHA, WA3WOD, KE3UM, and K3XO. STMA EC N3RVX reports 24 members; 4 nets (with a total of 31 check ins). 73 - Bill, with the nets. Net/Net Mgr/QND/QTC/QNI: MSN/KC3Y/30/49/222, MEPN/KE3OX/30/93/602, MDD/WJ3K/53/114/250, MDD Top Brass KJ3E 162, N3DE 137, W3YVQ 124, BTN AA3LN 30/41/404, SMN/KE3OX/3/6/25, AUG MDD/WJ3K/52/131/238, AUG MDD Top Brass W3YVQ 158, KJ3E 144, K3K3F 121. Tfc: KK3F 235, N3DE 205, KJ3E 148, W3YVQ 107, KG6TU 83, KC3Y 72, K3USO 61, KE3OX 47, WJ3K 45, KE3FL 33, N3WK 27, WA1QAA 18, N3EGF 18, N3RVX 17, N3WKE 12, WA3GYW 5, AUG N3WKE 27. PSHR: KK3F 160, W3YVQ 148, KG6TU 138, KE3OX 129, KJ3E 128, KC3Y 122, KE3FL 110, N3RVX 100, N3WK/92, WA1QAA 87, N3WKE 84, AUG N3WKE 91.

SOUTHERN NEW JERSEY: SM, Jean Priestley, KA2YKN (@K2AA) e-mail: ka2ykn@mosquito.com—ASM: W2BE, K2WB, W2OB, N2OO, SEC: W2HOB STM: W2UUV, ACC: KB2ADL, TC: W2EKB, SGL: KB2WYB, BM: KB2GNB, OOC: N2IE, PIC/PIO: N2YAJ, TS: W2PAU, W2BE, AB2Y, K2JF, W2BMN, KD4HZW, Spratly Island, a dream come true. Bob, N2OO, and Beth Schenck return to Spratly Island. The first trip wasn't completed so when good friend,

Alfons, 9M6MU, asked for help, a special event in Hillview gardens in Sabah, East Malaysia, off they went. Using 9M6HIL, efforts netted 5500 QSOs. While in the area, they operated in St Croix, the IOTA contest which yielded 1600 QSOs and 1000 QSOs outside of the contest. Efforts under 9M6OO, from Spratly Island (Layang-Layang Island) produced 10,000 QSOs. Congrats to Bob and crew, super job. What are you going to do now, Bob? In Burlington County on Sept. 27/28, joint ARES/RACES supplied communications and coordination for the South Jersey Regional Airport Air Victory Museum annual airshow. This was a first time venue for BCAR. It will be an annual ARES/RACES activity. Burlington County ARES/RACES also participated in a Hazmat drill at the Viking Yacht on Bass River. In August, Old Barney ARC had a successful special event at Barnegat Lighthouse with 600 QSOs and many visitors. Congratulations, W2UUV 215, W2CUW 134, K2UL 119, AA2SV 102, W2HOB-4 32, KB2VYZ 24, KB2VSD 22, K2UL-4 14, KA2CQX 12, N2WFN 12, N2FET 10, KB2CDB 7, W2AZ 6, N2FHJ 4, KB2VSR KB2BYM N2FHK N2SOE KB2HJJ 1.

WESTERN NEW YORK: SM, William Thompson, W2MTA —Club Officers: GRAM KB2UQZ KB2LXD KB2ZFH N2VTN; KLARA N2VFI WA2HDE KV2W N2VEB; Liverpool ARC N2UQ KB2SWN WA2DAD N2TAI KB2SWB; PROs KB2DNL KB2SCN N2LVB N2IFG; RAGS N2TRR KB2UQZ W2YIK WA2URK WA2PUU; RAPS N2OYG KB2WPT WB2BWQ; RAWNY WA2FKV KB2TJG KM2L KA2ORB. Club News: Congrats RAWNY on SSC renewal; Lancaster ARC, which was struck by up to 65KA of lightning, now has a Web Page—http://hamgate1.sunyerie.edu/~larc—thanks to PIO KG2IC. Rumor has it WYNDXA has demoted WB2ABD and W2WVC for lack of owl juice (refer inquiries to REPORT editor KF2YP about KB2ABD and WB2WVC). Club Annual Reports are lagging: Allegany, Kodak Park, Lockport, Margaretville, Niagara, Orleans, Post 204, RAGS, RIT, RVHFG, Rome Square Island, Tioga, Tompkins, U of R, and Unatego Checkout the ARRL Web Page http://www.arrl.org/Folks, it's a snap nowadays to file those club reports! Appointments: (LGL) KB2VLP; (OES) K2BWK KB2VLP KB2WII KC2AGS N2KZF N2ZWO WA2GUP; (OO) K2UCO; (PIO) KB2VLP KG2IC; (SGL) N2KYZ. HAMFESTS: Marathon January 10, Rochester May 29-31, Buffalo Sept. 19. Western District went heavy in public service these past two months supporting 700 bikers in the MS Bike Trek and by supporting Amateur Radio Demonstrations at the Erie County Fair and Exposition, thanks to efforts of K2OO, STARS and the many operators in the Western District. DATALINK: K2DN R 31/58, KA2GJV R5/53S, N2LTC R165/S199 NY2V R10/SO, W4BNY R5/SO. BPL: AA2CX N2LTC.

Net Name	QNI	QSP	QND	Net Name	QNI	QSP	QND
Early Bird	371	000	21	#STAR-FM	339	033	30
NYS RACES	070	008	04	#WDNE-FM	354	063	30
NYSR-CW	018	004	04	#NYSIE-CW	3166	177	30
#NYSM-CW	196	103	30	OMEN ARES	021	001	02
WEST-FM/SSB	724	1176	13	Oneonta ARC	030	004	04
Cleaning House	211	038	27	TIGARDS-FM	032	004	04
#WDM-FM	345	063	30	BRVSN-FM	265	009	30
#NY Phone	322	320	30	#CNYTN-FM	330	031	30
#NYPON-SSB	307	223	30	#OCTENL-FM	533	198	30
ESS-CW	3590	334	141	#WDM-FM	354	064	30
NYSPTAEN	388	044	30	VHF THIN-FM	014	000	01
#OCTENE-FM	1129	166	30				

(# NTS nets: * Public Service Honor Roll) Traffic (Sept.): N2LTC*1004, AA2CX*591, KA2ZNZ*422, KA2GJV*346, W2MTA*333, K2BCL*305, KF1I*237, W2IG*221, W2LJH*207, NY2V*162, W2OIX*154, AF2K*132, K2YAI*130, KB2TI*116, KB2UKF*116, KG2D*94, AA2ED*82, KB2KO*71, W4BNY*65, NN2H*57, K2DN*54, KC2AGS*47, N2JRS*45, N2CCN*34, N2OJI*29, KA2DBD*27, W2PII*22, KB2UQZ*18, KB2ETO*16, KA2QIK*11, N8JSO*9, KB2SCF 7. Seasons Greetings 73 to all. w2mta@juno.com.

WESTERN PENNSYLVANIA: SM, Bill Edgar, N3LLR—ASM: N3MSE. ASM-ARES/SEC: WB3KGT. ASM-Packet: KE3ED. STM: WB8KPE. TC/OOC: WR4W. BM: KC3ET. ACC: AK3J. PIC: W3CG. DEC-N1: N3YHP. DEC-N2: KD3OH. DEC-S1 & S2: N2PHF. 1997 is just about over and the new year is almost upon us. I'd like to ask a favor from each amateur operator in Western Pennsylvania. Please share this hobby with one other person in the coming year and invite them to join in. Could you imagine the number of amateur operators doubling in our section? The benefits would be numerous: more people to communicate with; more people to learn CW; more people to participate in club events; more people to participate in Field Day chores; and more people to meet and become friends with. Can I also stretch my request to ask you to also invite them to our club meetings and get them ACTIVE with club events? Your clubs need new members and if we don't invite new people to come to our meetings, they won't come. Very often, when we introduce the hobby to another person, we get all excited about the hobby ourselves. The same is true for clubs. If we share our club activities with new people, we

ATLANTIC DIVISION

DELAWARE: SM, Randall Carlson, WB0JJX, e-mail: WB0JJX@ARRL.ORG—Late September and early October appear to be public service months in Delaware with a variety of walks, exercises and drills taking place using Amateur Radio for communications. Many thanks to those who helped out all across the section providing this very vital service. On October 8, Amateur Radio participated in the annual Radiological Emergency Plan drill, held by the Delaware Emergency Management Agency. This was the first event held at the temporary EOC building. All the amateur equipment worked well. We do have some adapting to do because of the change of location, but that's what keeps it interesting. A new EOC building is currently under construction in the Smyrna area. The Delaware section now has a home page. Its URL is <http://gographics.com/Staff/RANDALL/Secpage.htm>. The site is still changing somewhat. The company providing the webhosting is a bit new in the game, and we both are on a learning curve, so please be patient if you run into any quirks with the site. Traffic (Sept): DTN QNI 91 QTC 22 in 22 sess. DEPN QNI 19 QTC 0 in 4 Sess. SEN QNI 56 QTC 4 in 4 sess. K3JL 34 WB0JJX 4. 73, Randall.

EASTERN PENNSYLVANIA: SM, Allen R. Breiner, W3TI—SEC: WB3FPL. STM: W3KOD. SGL: W3BKF. BM: WA3PZO. ACC: N3IGA. OOC: W3DZL. PIC: WA3DCL. TC: K3DS. ASM: WY3K. ASM: K3TX. ASM: W3ZVX. ASM: N3KYZ. Welcome to the newest appointments to our Section Field Services: OES to K3KSA, N3XPB, K16NJ, N3TDL, AA3C, WB3FQY, N3AT, N3PFF. TS to K3KSA, AA3C. PIO to WB3FQY, K16NJ, N3OFZ. LGL to WB3FQY, K16NJ, N3OFZ. W3UAQ was installed as Lieutenant Governor for the Pennsylvania State Kiwanis. He is also celebrating 10 years of broadcasting at station WBNB, Welsboro. N3AO spent some time canoe camping in the Adirondacks. Mr N3ORH and Mrs N3TJF moved to a new QTH. K3KFD was a visitor to VK-land. W3ZQN became granddad again. Communications were supplied at the Tioga County Early Days Fair by A3HI, N3BWB, N3HGY, N3OTO, W3BKF and W3QBZ. Congrats to the new up-grades: N3ZCT to General and N3YCZ made it to the big "X". AA3LQ is a new addition to the DXCC list. Dr. Jeff, KB3EVB, has been elected secretary of the New Jersey Academy of Family Physicians. For Novice-Tech classes in the Del-Lehi ARC, contact NU3L. Amateur class instruction in the OMIK Electronic Communications Assn. are being taught by AA3NV, K3VB, W3LVQ and held at the Christy Recreation Center. RAIN has come to the Marple Newtown ARC in the form of the Radio Amateur Information Net, held on 442.250 MHz. EC WA3FQY lists more than 40 dedicated ARES/RACES

Continued on page 126.

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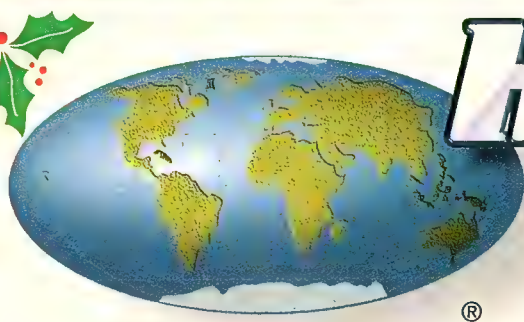
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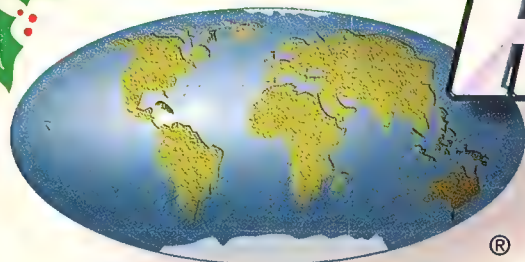
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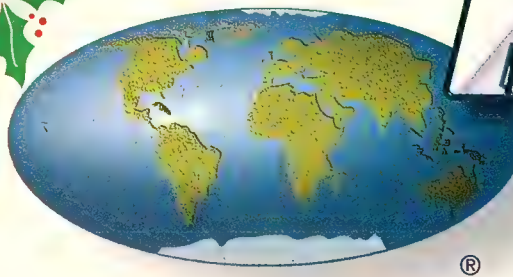
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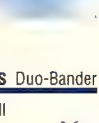


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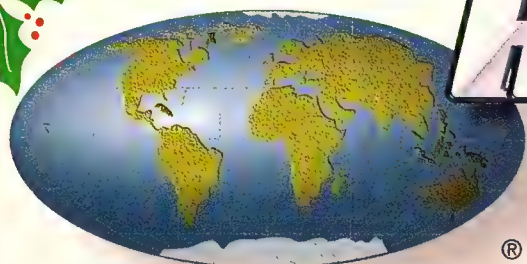
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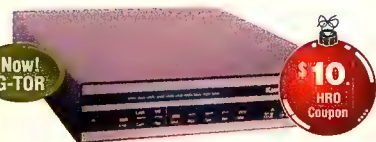
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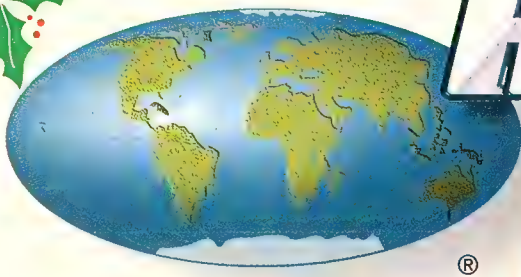
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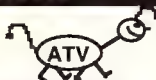
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get more excited about our club. Club membership is a key to growth within the hobby. Clubs get people involved with learning more about other aspects of the hobby. They also are a great way of sharing equipment expense and talents. Clubs also spearhead the local efforts whenever unfavorable governmental legislation is proposed. If you are not a club member, please feel free to contact me to find the closest Amateur Radio club. PSHR for Sept: W3OKN 129, T1c (Sept) N3COR 100, W3JUNX 98, N3ON 55, W3NGO 50, WB8KPE 41, N3KB 30, N3WAV 27, WA3QNT 18, W3GJ 18, KC3NY 18.

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WPA CW	N3COR	234	89	30
WPA PHONE	KA3EGE	480	51	30
NWPA2MTN	WA3ZSC	958	35	28
WPA2MTN	KA3BGC	256	34	30

Erie Mailbag resumes operation Oct 13, 8 PM, local time. Best wishes for a safe and happy holiday season, and a prosperous 1998! 73 Bill, N3LLR.

CENTRAL DIVISION

ILLINOIS: SM, Bruce Boston, KD9UL—SEC: W9QBH. SGL: WA9AQN. ACC: N9KP. STM: K9CNP. PIC: N9EWA. TC: N9RF. OOC: KB9FBI. Fire has destroyed a historic building complex in Canton. The International Harvester building went up in flames Aug 6, leveling nearly 2/3 of the 33 acre complex. Firefighters from 28 different fire departments fought the blaze for nearly 84 hours while volunteers, including a number of Amateur Radio operators, assisted with traffic, evacuation, and crowd control. The number of people involved numbered between 200-300. Among the volunteers were N9TYR, N9XJV, N9TTD, WB9KEW, KB9KAZ. On a happier note, The Fulton County Amateur Radio Club was involved in the Canton Friendship Festival Parade line-up in Sept. The parade had 23 sections and took 2 1/2 hours to setup. Emergency Coordinators throughout central Illinois attended a regional EC meeting in Lincoln on Aug. 16. Presentations were given by the Section Emergency Coordinator and Section Manager, as well as by K9ORP and WD9CIR. ECs from more than a dozen counties were represented at the meeting. The Metro ARC helped with the annual Parkside 5 mile run and 2.5 mile walk in Sept. The Peoria Area ARC is planning to offer Novice classes beginning in January. Young hams in the Peoria area can check-in to the youth net on 147.075-MHz Mondays at 9 PM. The Schaumburg ARC has voted to give up to 6 months of the club newsletter to new hams in the area. Members of the SARF are planning a tour of the Byron nuclear power plant. The Jacksonville ARC, Central Illinois RC, STARS, and several other clubs took advantage of the fine days of summer and held club picnics. The North Shore RC is considering a DXpedition this winter to one of the islands in Wisconsin. NSRC member W7T7 was awarded the Military Outstanding Volunteer Service Medal for his work in Amateur Radio and MARS. Over 1000 runners and joggers participated this year in Deerfield's traditional 4th of July 10K Mini-Marathon, and a number of amateurs from the area were on hand to provide communications. Members of the Lake County RACES group assisted with the Lake Zurich Triathlon. The Jacksonville ARS and the Western Illinois ARC have been designated Special Service Clubs for their commitment to Amateur Radio. To learn how your ARRL affiliated club can receive SSC status contact N9KP, the Affiliated Club Coordinator.

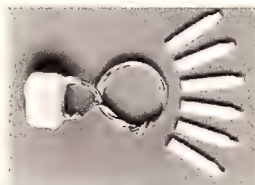
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CTN	147.090+	2100 Daily
IL ARES	3.905	1630 1st & 3rd Sunday
Macon Co	442.250+	2100 Wednesday
IEN	3.940	0900 Sunday
IPN	3.855	1645 M-F; 0830 Sunday
NCPN	3.912	0700 Monday-Saturday
NCPN	7.270	1215 Monday-Saturday

July traffic: W9HLX 97, K9CNP 63, WB9TVD 35, NC9T 24, KA9IMX 24, WA9RUM 7, W9FIF 6. W9VEY Memorial Net via K9AXS 8 with 180 check-ins. ISN report de WB9TVD QNI 217, QTC 54, stations 31. 9RN report for August traffic 225, sessions 62 in 385 min. August traffic: K9CNP 88, W9HLX 68, KA9IMX 42, WB9TVD 32, W9DT 32, NC9T 22, WA9RUM 7, W9FIF 6. WB9TVD ISN report QNI - 217, QTC - 58, sessions - 28. Ninth region Cycle 4 report for September, traffic 209, 60 sessions, 435 min, average 3.48, rate .480—ILN K9CNP KF9ME NS9F 95% rep. W9VEY Memorial Net via K9AXS 5 with 185 check-ins.

INDIANA: SM, Peggy Coulter, W9JUU — SEC: K9ZBM. ASEC: WA9ZCE. STM: AA9HN. OOC: KA9RNY. SGL: WA9VQO. TC: W9MWY. BM: KA9QWC: Sympathy extended to the families and friends of Silent Keys, June 7, Jack F. Palladay, N9ICE, Indianapolis; June 8, Eugene Van Sickle, W9KJF, Indianapolis; June 25, Glen Fletcher, N9ZFB, Sharpville; and July 5, Donna Shinabarger, AA9GJ, Daleville. They will be missed. If you noticed in the heading a change in our TC, yes, we have lost John Strawbridge, KF9IQ, who changed his call to K9IQ, to moving out of state. Our loss is OK gain. Good luck, John, on your new job and thank you for all your good works the past few years. We will miss you. We have a new TC, Ed Dunkin, W9MWY, just moving to South Bend has accepted the appointment. Thank you, Ed. We have a fine group of traffic handlers in the state, and I want to thank them for their dedication to the task. You will find them listed under D9RN and 9RN also the many others who QNI ITN, QIN and ICN. I want to recognize them for the unselfish work they do in the interest of Public Service. NMs ITN/W9UMH, QIN/WB9TUS, ICN/AA9HN, WN/WA9OHX, VHF/AA9HN, BBS/WJ9U

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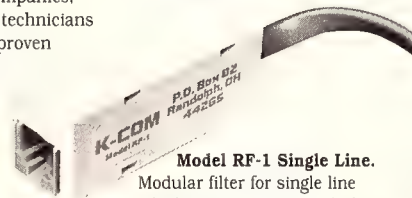
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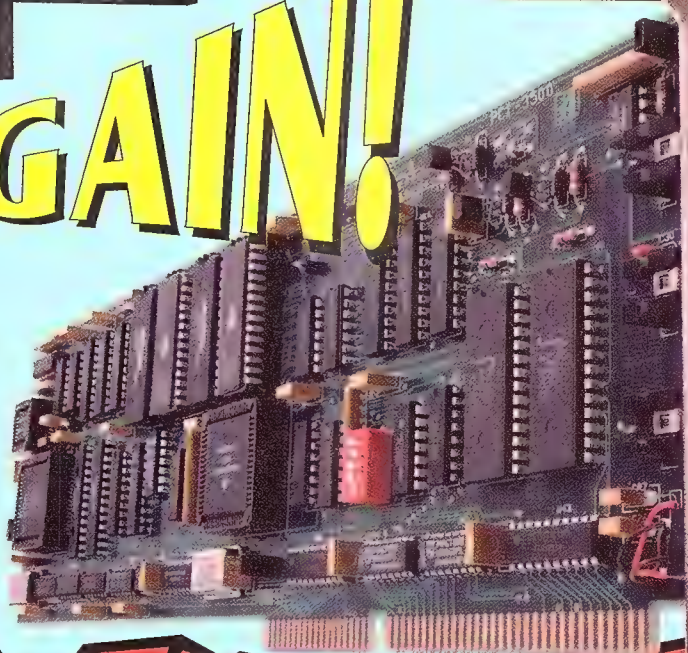
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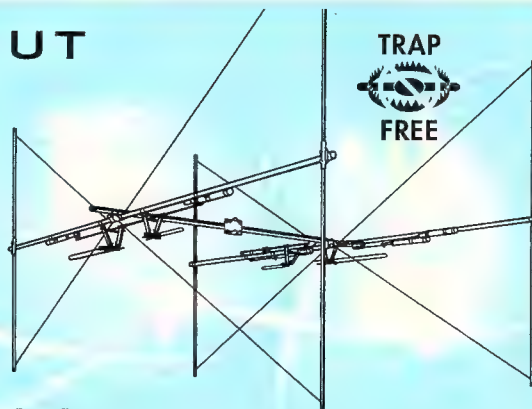
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QIN	3656	1430/0000	no report			
ICN	3705	2315	no report			
IWN	3910	1310	2267	—	300	30
IWN VHF Bloomington			462	—	450	30
IWN VHF Kokomo			702	—	150	30
IWN VHF Northeast			801	—	600	30
Hoosier VHF nets (8 nets)			613	53	244	38

D9RN May report QTC 341 in 61 sessions IN participation 92 % by K9GBR, W9UEM, KA9MSR and KA9DIG. June report QTC 247 in 58 sessions IN participation 90% by K9GBR, W9UEM, KA9MSR and KA9DIG. 9RN QTC 180 in 59 sessions by K9PUI, AA9HN, K9J, K9OD, WA9QCF, WB9UYU and W9FC. Tfc: W9FC 163, W9UMH 133, K9OD 95, WB9QPA 79, K9GBR 74, N9ZDZ 73, AB9AA 59, K9J 59, K9OIM 58, W9JUU 52, K9PUI 49, W9UEM 48, KA9QWC 35, KA9DIG 33, KA9EIV 29, W9EHY 22, K9RPZ 18, KB9WI 12, AA9HN 10, N9VTS 8, W9RTH 7, W9CSJ 7, K9OUP 6, W9KT 5, KB9NPU 4, AB9A 3, N9JAI 3, N9HZ 1, WB9NCE 1.

WISCONSIN: SM, Roy A. Pedersen, K9FHI—SEC: WB9SMM. STM: KA9KLZ. ACC: N9TD. SGL: W9RYA. OOC: W9RCW. PIC: K9ZZ. TC: K9GDF. ASM: W9CBE. K9UTQ. BM: WB9NRK. Watertown ARC had a tour of Ixonia Fire Station, K9J1 stepped in a hole and twisted his ankle. (Watertown Newsletter.) Interesting facts from History Buff MRAC, very nice article. (Hamateur Chatter). Do you know which environmental element causes the most deaths, injuries and damage? Floods? Hurricanes? Tornadoes? None of the above—lightning is the culprit. (Ozarks Newsletter) Greenfox picnic went well until the rains came but the auction was just about done at that time. Greenfox needs the help of its members, please. (Foxtales). Soon will be the time of the year that old Saint Nick will be around. Do you have your Christmas shopping done? Do you fellows have your antennas all ready for winter? W9KJR, Milt Peters, became a Silent Key July 24. He became a member of MRAC in 1946 and a life member in 1967. He became known as the man who built and gave away kaleidoscopes, because they were too expensive in the stores. (Hamateur Chatter). Madison area repeater association hamfest is April 5, 1998, and is ARRL sanctioned at the new location John Q. Hammons Trade Center. W9IHW had eye surgery, and Gus says he can see better now than he has for many years. Fox Cities ARC had a good time at the EAA flyin. Ham radio will benefit from New Ace Spacecraft, such as near Earth and interplanetary space environments. (QSO'R). Rock River Club Campers (RRRC) had a good time camping. KA9KLZ, KB9KVD, N9TFQ, KA9NRH, KA9BAC, KA9BAE, K9FHI, but it was chilly one morning. KB9MKP, KB9OKH were visiting the campers one afternoon, campers don't go hungry. Is your club affiliated with ARRL? I just received a recent list of such clubs. There are 46 in Wisconsin. Sorry to report W9PKT a Silent Key. Thought for the day: Have faith in what you believe and don't give up on the future. I need more news from you for this column. Tfc: K9JPS 789, W9IHW 779, WB9JSW 714, W9RCW 643, K9FHI 165, AG9G 137, N9BDL 93, KA9KLZ 81, W9CBE 78, W9YCV 76, N9CK 73, KA9FVX 64, N9KHD 54, KE9VU 52, W9UW 39, K9GB 33, K9GU 29, K9UTQ 29, K9HDF 29, KB9ENO 24, W9ODV 24, KA9BHL 23, K9LGU 20, K9DHR 19, N9JY 16, W9PVD 8.

DAKOTA DIVISION

MINNESOTA: SM, Randy "Max" Wendel, N0FKU—The annual meeting of Assoc of Emergency Mgrs was held at Ruttgers Lodge in late September. I, along with SEC Gary Peterson and ARES ECs Gerry Nies, N0NGW (Grand Forks) and John Engel, WA0LPV, (Polk/E. Grand Forks) presented ARES to some 200+ emergency mgrs from around our state. I'm confident we opened more doors and gave ARES yet another boost with our presentation. Gary produced and showed an excellent 10-minute video of ARES flood action he filmed while in GF/EGF at flood time. Great job Gary and also to Gerry and John for their talks at the conference! What a great feeling to see our ARES ECs leading the way! Additionally, I'm also continually impressed with the ARES participation of folks in SE Minnesota. Groups from around Rochester to Winona, Spring Valley to LaCrosse really doing a great job! Not to mention the exercises...one in Winona on Sept 20 and yet another at Good Earth on Oct 12. Lots of participation from several officials and groups...state/local gov't officials, K-9 SAR teams, to name a few. YOU folks really set some GREAT examples...keep up the great work. Getting together and participating really helps keep continuity for your area. We have a new NM for our MN 75m Section Net: Jerry Fraser, W0WVO, of Marine/St Croix, replaces Judy Mortenson, WB0WNJ, of Tracy. Thanks, Judy, for all you've done, and welcome Jerry who has been a supportive participant on the evening net. We have a new Bulletin Manager. Dave Mangin, N0TXW, of St Paul replaces Rob Bayer. We seek those ARRL members who would like to officiate themselves as an informative resource for their respective area. Please contact Dave for sign-up as Official Bulletin Station, 612-633-2317. We need a good network of OBSs to help disseminate bulletins and other pertinent info to hams statewide in a time effective manner and we need YOUR individual help to create this system, acting as a valuable service in your ham community. I urge all hams and radio clubs to help us seek field organization members willing to help meet our goals in helping you and other radio amateurs. Contact me (QST p. 12). de N0FKU. Public Service: WB0WNJ, W0LAW, K0PZ, WA0TFC, W0HPD, W0GRW, KB0AI, KN9U, KA0IZA, KB0AIJ, K0WPK, W3FAF, WD0GUF, KB0CHI, N0JP, KD0NN, N0AU, K0OGI.

NORTH DAKOTA: SM, Bill Kurti, W0CM—SKYWARN is slowing down now that fall is upon us. A big thank you to all the section hams that have made this program a success in our section. Part 2 of 2 by WA0YSF, Flood Fight in the Northern Red River Valley by the Cavalier County ARC. The cities of Drayton and Pembina were saved by their dikes, those outside of the dikes were not as fortunate. After the crest had passed, we continued to provide support to Red Cross, Salvation Army, US Coast Guard, National Guard and Sheriff's Dept. as needed. On April 30, we went on standby. This was our second flood, with 1996 being almost as bad. We are gaining experience and things seem



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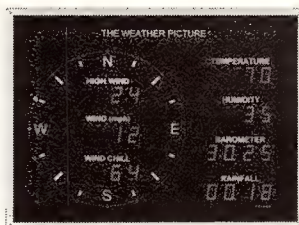
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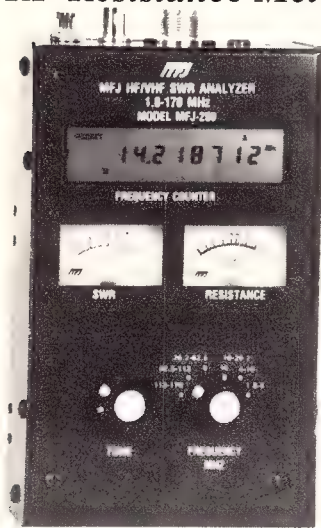
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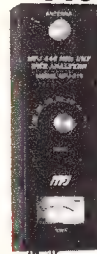
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to be going smoother as we learn. Now it's time for SKYWARN to get active, if it would just rain! We have gone from the worst flood of the century to drought in just a couple months. Harold McConnell, WA0YSF, Pembina County RACES Goose River Net 1985 kc Sunday 8:30 AM 4 sess 44 QNI 2 QTC KE0XT mgr Data net, 3937 kc daily 6:00 PM, 30 sess 625 QNI 41 QTC KE0XT mgr.

SOUTH DAKOTA: SM, R. L. Cory, W0YMB—Dakota Chapter 102 QCWA will operate a special event station next Feb 21-22 and will be using their new club call sign W0DAK. This will be in celebration of their 21st anniversary. Watch for more details on this later. Pierre ARC is planning a special event station for next Aug to Honor Oscar Micheaux a black pioneer who wrote books and produced movies. He was the author of the Conquest. There was plenty of food at the LARK picnic at Watertown on Sept 20. Eleven people came to the event and the club paid for 35 meals that were catered. A 440 repeater is going to be installed at the Big Stone power plant. Another one is in the planning stage for a link between Arlington and their 67 machine but this one is not set in concrete. Participation has declined on the novice net during August. It was 2.75 average for the four sessions. How about giving them some help? Sunday evening at 7 PM central on 3700 kHz. The upper HF bands are improving as we are coming out of the bottom of the skip cycle. Traffic reported for September was 497.

DELTA DIVISION

ARKANSAS: SM, Roger Gray, N5QS, e-mail n5qs@arrl.org — Christmas is coming up and December is dedicated to parties and fun. This is also the time of year for the low bands to come alive. I have heard that the interest in Amateur Radio follows the sun spot cycle, and from my short time in the hobby this could be true. We are coming up on a period of new activity on the upper HF bands that promises to be lots of fun. This would be a good time to encourage someone to become a ham or to upgrade their license so they can enjoy all the great fun on HF. The school Club Roundup is coming up February 10-14. This is a very good time to promote our hobby. Now is the time to find a local school and set up a station for a week and show the kids what we do and how much fun it can be. Another idea for this event is to work with your local school and make some handouts for the kids to take home to their parents and invite them to visit the station sometime during the event. Till next month take some time to enjoy this wonderful hobby. I hope Santa brings you a lot of new Amateur Radio toys. Tfc: W5RIT 80. PHSR: W5RIT 119.

LOUISIANA: SM, Lionel A "Al" Oubre, K5DPG, e-mail k5dp@arrl.org Web Page www.alp.net/k5dp —ASM: KB5CX. ACC: KA5IJU. BM: K5ARH. TC: K5FZ. SEC: KA5YDJ. OOC: WB5CXJ. PRC: KB5QV. STM: K65GE. NM LTN: WB5ZED. NM LSN WB5CDX. NM LCW: W4DLZ. I wish to take this opportunity to wish each and all of you and your families a very Merry Christmas and a Happy New Year. May 1998 bring you all the good things of life and that new rig that Santa promised! This has been the Year of Public Service for Amateur Radio. There has been a noted increase in the number of events being reported to this office. Thanks to all of you that participated. Public Service is the major activity that helps to justify the retention of our amateur bands. Let us all make a resolution to participate in at least one event during 1998. Hopefully each of you has exercised your rights and voted in the Division Election. Up coming hamfest are: Minden Dec 6, Hammond Jan 17, Lafayette March 13-15. Louisiana section net schedule: LTN 6:30 PM, local, 3910 kHz, nightly, WB5ZED NM; LCW 6:45 PM, local, 3673 kHz, nightly, W4DLZ NM, LSN 8:30 PM, local, 3713 kHz, Mon-Fri WB5CDX NM/K5WG Asst. Reports Sept: LTN QNI 326 QTC 116 in 30 sess; LSN QNI 71 QTC 11 in 30 sess. LCW QNI 122 QTC 37 in 29 sess. DRN5 LA represented 100% by K55GE, K5WOD, K5IQZ, WB5ZED, WB5CDX, AB5YS, N5NI, WA5LHL, K5DPG. PSHR: WB5CXK 73, W4DLZ 78, K5SWG 84, K5MC 93, K55GE 110, K5WOD 116, WB5ZED 150, K5DPG 166, K5IQZ 286. Tfc: WB5CXK 4, K5WOD 6, K5SWG 14, K5DPG 77, K55GE 51, W4DLZ 34, K5IQZ 436.

MISSISSIPPI: SM, Ernie Orman, W5OXA—ASM: KJ5RC. SEC: STM: KB5W. OOC: WV5Y. BM: W5EPW. PIC: AA5SP. SGL: KB5ZK. TC: N4KMH. ACC: K5VXV. Home Page is "http://users.aol.com/w5oxa/hpage.htm" I would like to take this opportunity to thank all of the operators that helped out in the ARRL SET for 1997. There is always much work to do and it takes time to do it. Those that give of their time and efforts are to be highly commended. Throughout this state, I keep running into those kinds of ham operators. They make effort well worth it. MISS. CAR TAGS. We now have an official Amateur Radio car tag for our state. I have a replica of it on the web page newsletter. It is not exact, but will give you an idea as to what it will look like. Hope you like it. It's the best we could do. Net reports Sept. DRN5: 60 sess, 571 QTC, MS rep 100% by W5OXA, N5XGI, KD5P, W5HKW AND N55M, JC Emgr Net 30 sess; 447 QNI; 33 QTC; 96 EP. Laurel ARC (VHF) 5 sess; 106 QNI; 1 QTC. Lowndes Co ARC sess; QNI; QTC Magnolia Net: 30 sess; 830 QNI; 4 QTC. MSPN 30 sess; 2299 QNI; 42 QTC MS Baptist Net: 4 sess; 21 QNI; 0 QTC; EP. MS Slow Net Sess; QNI; QTC. MS/LA Emgr Net: 4 sess; 103 QNI; 0 QTC; emgr sess PBRA Net (North) 30 sess; 740 QNI; 149 EP; Hattiesburg A.E. Net 4 sess; 79 QNI; 4 QTC.

TENNESSEE: SM, O. D. Keaton, WA4GLS—ASM: WB4DYJ. PIC: W4TYU. STM: WA4HKU. ACC: WA4GLS. OOC: AD4LO. TC: KB4LJV. SEC WD4EKA presented the ARRL Charter of Affiliation to John County ARC on Sept. 16th & SM, WA4GLS presented the ARRL Charter of Affiliation to TN Contest Group on Sept 6th. This brought the total TN ARRL Affiliated clubs to 43. Ten other clubs have inquired into the affiliation process during this year. Hope all become affiliated in the near future. ARRL affiliation is desirable because it is profitable to both the club and ARRL. DARC is fortunate to have Delta Division's Vice Director, Mr Henry Leggett, WD4Q and Mr James Butler, KB4LJV, TN Section's Technical Coordinator, as club members. Both had articles in Sparks this month. Thanks to BSFARC members KE4ARKJ, KE4YIH, W4NPL, KE4QQF, WA4WMN and KF4MVS for providing communications for the Ride the Edge, KE4UIW was there as part of the association. C.A.T.S. (Communications and Technology Society) added 145.23 repeater to its system. According to the report in Spectrum this month, C.A.T.S. repeater system consists of

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SP-23	1296	<.9	18	100/10W	359.95
SP-13	2304	1.2	18	50/10W	379.95
LNA	144	<.4	18	NA	219.95
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6 repeaters along with 5 other affiliated repeaters. It supports the Rutherford Co ARES and other non-profit organizations that may need assistance. *MARC News*, a publication of the MARC, features a column called, "How I Became a Ham." Very interesting reading, and maybe other clubs will consider such a column in their publications. Thanks to all RACK members who supported the MS Bike Tour. *Zero Beat* editor AC4QZ, is hoping to step down at the end of 1997 because of "burn-out." Someone please volunteer to accept this post, because we surely don't want this publication to stop. CARC has developed an Elmer concept as a club-sponsored activity. Various hams have volunteered to be the Elmer in their expertise. I think this is an excellent approach to teaching the different topics of ham radio. Net Sess/QTC/QNI: TCWN 22/36/200; TEMPN 20/22/571; TEPN 25/118/2571; TSCWN 20/7/62. Tlc: NZ4O 348, N4PU 98, WA4FMR 64, WA4HKU 50, W4SQE 48, KA5KDB 41, WB4DYJ 37, N4LA 34, WA4GLS 19, W4HZD 14, K4TAX 8, K14V 6, WD4EKA 5, W4SPN, 4, W4IKK 2, KR4YI 1.

GREAT LAKES DIVISION

KENTUCKY: SM, Bill Uschan, KC4MIS—ASM, Tom Lykins, WD4RWU. SEC: Craig Still, KD4PWK. ACC: John Embry, K4AT. PIC: Steve McCallum, W2ZBY. TC: Scotty Thompson, K1AT. STM: John Farler, K4AVX. SGL: Ron Landrum, KM4DX. BM, Ernie Pridemore, KC4IVG. First I would like to welcome aboard Ernie Milton as the Kentucky Section's new Bulletin Manager. Guess the hamfests are over until Cincinnati in late February. On September 22, 1997, Amateur Radio lost one of its most avid supporters. Mr Al Severson, AB8P, became a SK. Mr Severson was a great man as far as this Section Manager is concerned and was a great loss to Amateur Radio. I want to take this opportunity to wish everyone and their families a Happy Thanksgiving. Soon it will be time for old Santa to make his appearance. From the information I received it looks like the SET that was held on October 4, 1997, went very well. I would like to take the opportunity to welcome the following Ham operators to ARES and Field appointments: Wendall Curry, K4JZ, EC for Calloway Co.; Scott Thile, KU4GR, EC for Trigg Co. and an OES for Trigg Co.; Ron Ritchie, KF4MOM, EC for Fayette Co.; Frank Kirby, KT4SH, OES for Trigg Co.; Bobby Mosely, KF4OQA, KES for Rockcastle Co.; and finally Eddie Mosley, KF4QWQ, also OES for Rockcastle Co. Net/QNI/QTC/Sess/Mgr. MKNP/1812/30/33/WD4RWU. KTN/1193/41/30/N4AFP. KEN/168/0/5/KD4PWK. CARN/406/89/29/KN4IV: TSTMAN/N/A/89/29/KB8GWL. 4ARES/464/3/5/WA4RRR. KRN/591/22/21/N4AFP. Tlc: K4AVX 52, N4GD 35, WA4HLW10, N4LQ 4, K4OL 9, KD4PWK 5, WB4ZDU 11.

MICHIGAN: SM: Dick Mondro, WA4FQT—ASM: Roger Edwards, WB8WJV @ WB8WJV. ASM: John LaRock, K8XD. SEC: Deborah Kirkbride, K8YKK. STM: Dale Cryderman, KA9EIZ @ W8EHH. ACC: Mike Pearsall, N8PM. OOC: Mark Drolia, N8IQX. PIC: Greg Ozimek, WB8FNQ. SGL: Ed Hude, WA8QJE. TC: Dave Smith, W8YZ. VHF/UHF Net Manager: Paul Harmer, KB8ZDV. Section Newsletter Editor: Dave Colangelo, KB8RJL. The weekend of October 4&5 was busy with SET 97 activity. I am proud of our NTS and ARES teams that displayed their operating skills in traffic handling and emergency procedures. My thanks to all participants for a great team effort. Please remember to check in to the Michigan Section ARPSC Net on 3.932 every Sunday afternoon at 5 PM local time for updates on what's happening in the section. Congratulations to the new officers of the Midland Amateur Radio Club. They are: President Eldon Hall, N8STF; VP Dorie French, N8WTO; Secretary Ruth Tallman, KC8FDM and Treasurer Larry Mackin, N8CPG. Congratulations also to the Hiawathaland Amateur Radio Associations recently elected officers. They are: President Rich, AD8U; VP Bruce, K88YT; Treasurer Bill, N8NRG; Secretary Paul, N8XTB and Board Member Greg, K18AF. Good luck with all your club activities. Come out to the December 6, 10 AM meeting of the City of Detroit ARES team at the new midtown VA Hospital 4646 John R @ Canfield, Detroit 48201. Their speaker will be Assistant Section Manager for ARPSC Roger Edward, WB8WJV. Here is a great opportunity to attend a meeting in this beautiful new building with free parking in the deck (blue area) and hear about the ARES/NTS program from our Section Leadership. Everyone invited. We all get frustrated from time to time with things that just don't go our way in our associations with various clubs or organizations that we belong to, or people that we know. Rather than continuing to kindle the flames of destruction, let's all vow to forget the past that we cannot change, and look forward to the future with a positive attitude. You'll feel better about it because you have eliminated stress that is self-defeating. Remember to treat others as you would like to be treated and perhaps bring a little joy into the lives of others and yourself. Every year when the Holiday Season comes around, I realize that the best gift that I receive each year is meeting folks, like all of you, throughout the year. May the spirit of the Holiday Season that forever endures, leave its richest blessings in the heart of YOU and YOURS. Happy Holidays and Peace to all. Dick, WA4FQT. HELP WANTED: A team player to take on responsibilities of "Bulletin Manager," a section-level volunteer appointment. Salary: Self satisfaction. Info: Please contact Michigan Section Manager listed on page 12, QST, September 1997 NTS Net Reports:

Net	QNI	QTC	Sess	NM	Freq	Time	Day
QMN	667	222	59	WB8SIW	3.663	6:30/8:10 PM	Daily
MACS	381	65	28	WB8RNO	3.953	11 AM	Daily (1 PM Sun)
MITN	560	142	30	KA9EIZ	3.952	7 PM	Daily
UPN	1501	56	34	WA8BDB	3.921	5 PM	Daily (Noon Sun)
GLETN	735	92	30	VE3SCY	3.932	9 PM	Daily
SEMTN	606	76	30	W1BK	145.330	10:15 PM	Daily
TATN	216	07	11	KC8FXF	147.300	9:30 PM	Daily
WSSBN	867	46	30	K8GOU	3.935	7 PM	Daily
VHF	512	34	81	KB8ZDV	Various		Daily

Tlc. reports for September: KA9EIZ 146, WX8Y 107, WB8RTN 100, N8FPN 76, K8JN 72, W1BK 68, K8GXV 62, KB8ZY 57, WA8DBH 48, WB8RNO 44, WA8JXG 41, N8TDE 40, K8UPE 30, K3UWO 26, WB8F 22, K8ZJU 18, AA8SN 16, N8OSC 16, KB8JG 13, W8YJ 13, WB8WJV 8, KC8GMT 7, KA8LAR 6, WB8BGY 2.

OHIO: SM, David Kersten, N8AUH, @WB8IZ (see p 12) or kersten@irmg.com—ASM: John Haungs, WA8STX 513-

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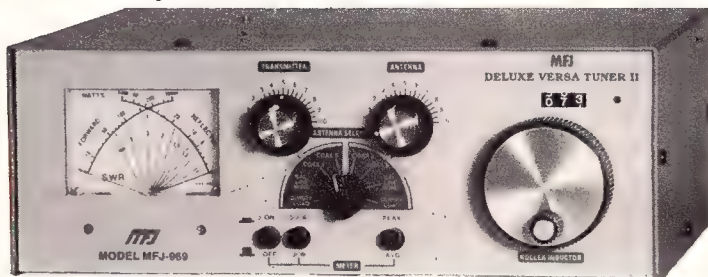
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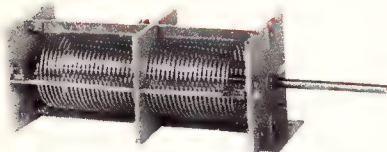
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Lighted Cross-Needle meter lets you read SWR, forward, reflected power simultaneously. Read peak and average power in two ranges.

The MFJ-989C's six position antenna switch is made of two individual ceramic wafers wired in parallel. Wide spaced, heavy duty contacts handle extreme current and voltages. We've never burned one up!

MFJ's heavy duty current balun has two giant 2 1/2 inch toroid cores with Teflon® wire connected to ceramic feedthru insulators. You can use balanced lines without core saturation or voltage breakdown.

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MFJ versatile 1.5 KW Tuner



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772-7378 or wa8stx@aol.com. ASM: Steve Wolf, W8IZ (Packet @W8IZ). SEC: Larry Solak, WD8MPV 330-274-8240. STM: Jack Wagoner, WB8FSV, fsv@netwalk.com. ACC: Joanne Solak, KJ30/8, 330-274-8240. BM: John Schlueter, W8WYH, @W8BI. TC: John Fakan, KB8MU. SGL: Paul Krugh, N2NS, @W8CQK. PIC: Beverly Priest, N8VZV, mapriest@erinet.com. OOC: Paul LaFollette, Jr. WB8ONA, wb8noa@worldnet.att.com. Dave's ASM scribe had to take over the September reports while Dave was traveling in Europe. PIC, Beverly Priest, N8VZV, presented the Ohio Section club newsletter contest winners. 1st place: DARA RF Carrier, Editor, Mike Priest, KB8JUA. 2nd place: Capital City ARC Columbus, Radiogram, Editor, Keith Chambers, KQ8H. 3rd place: Newark ARC Ham Chatter, Editor, Pete Rehner, KB8RJU. The Capital City Repeater Assn Columbus salutes William Tabor, N8NIO, as Mr Amateur Radio, one of its most dedicated workers. Thurman Chastain, WB8WZR, received the 1997 Distinguished Service Award by Dayton ARA for devoting 40 years to DARA in various capacities. Oh-Ky-In established the John Hugentober, N8FU, CW proficiency award to promote and instill proficiency in the art of CW in memory of N8FU, an amateur known throughout the world for his skill in CW. Tusco ARS Hamfest in Dover, OH, January 25. Mark your calendar for the Great Sakes Div in CA, Convention in Cincinnati, Feb 21-22. Cuyahoga Falls hamfest Feb 22.

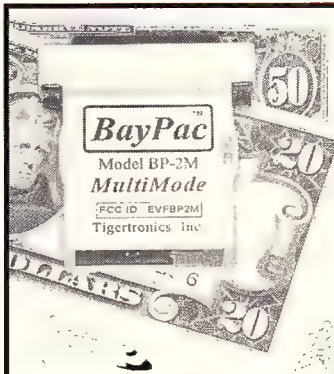
Net	QNI	QTC	QTR	Sess	Time	Freq	NM
BNE)	153	78	264	30	1845	3.577	WD8KFN
BNL)	229	102	419	30	2200	3.577	N8VB
BNR	120	44	900	29	1800	3.605	W7LDO
OSN	126	57	501	30	1810	3.708	WB8KOJ
OSSBN	1854	461	2061	90	1030	3.9725	KF8DO
					1615,1845	3.972	
OH Section ARES net					1700 Sun	3.875	WD8MPV

Tfc: N8IXF 270, KD8HB 165, WD8KFN 157, KA8HBN 140, KF8DO 137, W8PBX 135, K8DHD 129, N8CW 84, KB8VVB 79, N8FWA 75, K8OUA 71, WA8EYQ 66, N8EFB 66, WD8KBW 56, W8LDQ 55, K5WOQ 55, N8DD 48, WA8SSI 47, N8SC 40, N8CX 35, W8VEK 34, N2NS 32, W8JLW 29, N8YXL 29, N8TIV 28, KB8ROA 27, KD9K 27, NY8V 25, KA8MPD 24, N8VES 23, K8IG 22, KC8FUY 22, KB8TIV 21, K18O 19, KB9GGA 18, N8UEO 17, W8AO 16, W8BO 16, K8FWO 14, WB8FSV 12, KB8UEY 12, N8RRB 11, KF8FE 11, K8WC 10, WB8KWD 10, W8GAC 10, KC4IYD 8, KC8EQA 6, AA8XS 5, W8MIO 6, N8GOB 5, K8QIP 5, KD8XL 4, KA8GOV 3, KC8HTP 3, W8GDQ 2, N8VET 1. (Aug) N8VES 61.

HUDSON DIVISION

EASTERN NEW YORK: SM Rob Leiden, KR2L (@WA2UMX)—STM: Rick Warren, KF2YC. SEC: Tony Pazzola, WB2BEJ. ASM/ACC: Tom Raffaelli, WB2NHC. SGL: Phil Bradley, KB2HQ. PIC and BM: Steve Anderson, WA3RKB. OOC: Hal Post, AK2E. TC: Elmer Sharp, WA2YSM. ASM: Andrew Schmidt, N2FTR. ASM: Bob Chamberlain, N2KBC. ASM: Richard Sandell, WK6R. Net Reports (September 1997) Checkins(QNI)/Traffic handled (QTC/QSP): AESN: 49/6 CDN: 426/151 ESS 334/282 HVN: 562/148 NYP: 322/648 NYPON: 307/450 NYS/E: 316/366 NYS/L: 236/347 NYS/M: 196/222 CGESN 587/0 (1/1-9/30). The SET in ENY was a great success thanks to the many fine folks throughout the ENY Section who helped out. Special thanks go out to April Stack, KA2QIG, who did a great job of organizing several events on very short notice and to Tom, WB2NHC, Sandy N2SF, Alan, N2YGC, Joe, WB2VVS, and all the folks in WECA who executed the "Hurricane Sandy" drill. Special thanks also go out to Pete, N2YJZ, who expertly handled dozens of pieces of traffic on both HF and VHF during the SET and the many NCS who helped out on 75 M. I'd like to thank the new ENY Webmaster, John Czukkermann, KB2WJG, for taking over the ENY Web Page from Keith, who did a great job in setting up and running the page. We will soon be relocating the ENY Web Page to a new site with more space and faster access. While on the subject, check out ASM Andrew Schmidt's new ENY event board. Be sure to e-mail him with your upcoming events. Happenings: The ENY staff has rescheduled its meeting to 12/6 in Suffern, due to scheduling conflicts. Are you planning your club's holiday party? It's a great opportunity to make new friends and have a great time! PSRR: N2YJZ, KF2YC, N2JBA, WB2IIV Tfc: N2YJZ 432, KF2YC 102, WB2IIV 67, N2JBA 58, WB2ZCM 34, N2AWI 19, 73, Rob.

NEW YORK CITY/LONG ISLAND: SM, Len Buonaiuto, KE2LE—ASM: KB2SCS. ASM: KD2YA. ACC: K2EJ. STM: WA2YOW. OOC: N2JIX. PIC: N2RBU. TC: WY2U. BM: KC2FD. SGL: W2UFO. LGL: KA2RGI/ Babylon. LGL: WA2KXE/ Long Beach, WB2MGP/ Staten Island. LGL: KB2TWO, Queens. LG.: N2HH, Oyster Bay. First, I would like to wish all a very happy holiday and healthy one. I would like to thank all who have supported us and our policy in the past year. The year has seen some good and some bad, however it will not stop us from keeping the NLI section the very best in 1998. There were many changes in the past year and 98 holds more changes as well. All a must for a dedicated section manager and newly appointed staff members. A lot of jobs will be taken over by the new appointment of ASMs and the elimination of some old, out-dated positions. A closer and new group of staff members who share in present administrations views and policy will be forthcoming. My deepest thanks go to KD2YA/ASM, N2NFI/DEC Suffolk county, WA2YOW/STM and many others who helped bring the truth and info to our section members. 1998 will be time for all interested in ARRL section positions to step forward and be seen and heard. We want to get the message to all hams to be a part of the ARRL and be responsible for building up our ranks. Again, have a happy holiday and let's enjoy our new gifts and rigs. NYC/LI VE exam list as follows. VE sessions: Islip ARES, 1st Sat. 9 AM, Islip Town Hall West 401 Main St. Islip, Addison Levi, KD2YA 516-234-0589; Bears VE: ABC Bldg Cafeteria, 125 West End Ave at 66th St, Call hotline 212-456-5224 for exact dates & times, Jerry Cudmore, K2JRC. Grumman ARC (W5YI) 2nd Tues 5 PM, Northrop-Grumman Plant, 5 S Oyster Bay Rd via Hazel St, Bethpage, NY, Bob Wexelbaum, W2LP, 516-499-2214, LIMARC, 2nd Sat, 9 AM, NY Inst of Tech, 400 bldg, rm 409, Northern Blvd, Old Westbury, Al Bender, W2QZ, 516-623-6449; Gallups Island RA, 3rd Sat, 1 PM, USMMA, Bowditch Hall, Steam-



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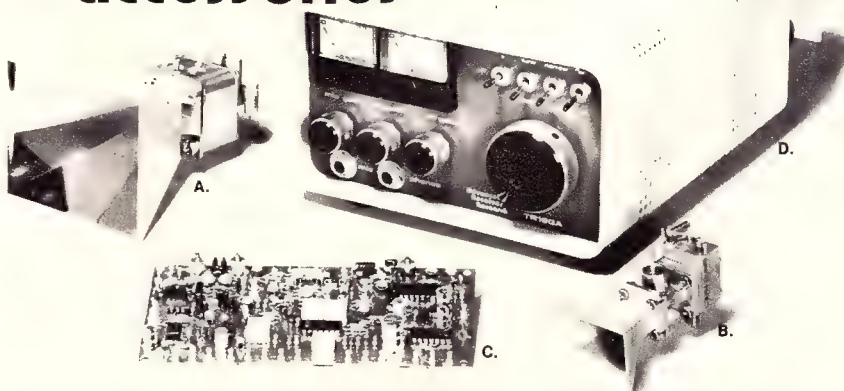
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boat Rd Kings Point, NY, Les Rauber, AA2E, 516-922-0947. Great South Bay ARC 4th Sun12 PM, Babylon Town Hall, ARES/RACES Rm 200, E Sunrise Hwy. N Lindenhurst. Tom Carrubba, KA2DFO, 516-422-9684; Hellenic ARA: 4th Tues 6:30 PM, Pontion Society, 31-25 23rd Ave, Astoria, NY, George Anastasiadis, KF2PG, 516-937-0775; Larkfield ARC: 3rd Sat 9 AM, Huntington Town Hall, 100 Main St. Huntington, NY, Joe Coffield, W2DDZ, 516-266-3192; Columbia U VE Team: 3rd Mon. 6:30 PM, Watson Lab 6th floor 612 W 115th St NY, Alan Crosswell, N2YQK, 212-854-3754; PARC: exams held every three months at Southold School Oaklawn Ave. Southold, NY on next to last Friday of the month. 6:30 PM, all classes of licenses. For info, contact Ralph Williams/N3BT, 516-323-3646. Report all changes to KE2LE before 12th of the month. Tfc: KA2VZX 829, WB2GTG 150, N2AKZ 128, N2WGF 100, KB2WYE 96, KB2KLH 71, N2XOJ 87, KB2GEK 56, NB2D 28, WA2YOW 28, AA2NX 20, KC2ACL 18, N2ZM 16, WA2VZK 2.

NORTHERN NEW JERSEY: SM, Roy H. Edwards, Sr., AB2RE, AB2RE@AB2RE-4, e-mail: AB2RE@arrl.org—ASM: KB2CMF, ASM: OOC KB2JSG, ASM: N2WZB, NNJ Webmaster, Volunteer Counsel/N2IOB, BM: N2LXM, SEC: KB2WNZ, STM: WB2FTX, PCT: N2TTP. My first thoughts for this column are concerning the section OOC Marty Goldfarb, KB2JSG. Marty is currently recovering from some cardiac problems. I am sure I am speaking for the membership of the section as well as many others as I wish you, Marty, a speedy recovery. Marty is doing a great job in his position improving the effectiveness of the Amateur Auxiliary in our section. Marty has begun networking with surrounding counterparts and exchanging ideas and reports. He has recently spoken at club meetings explaining the responsibilities and duties of his position and those of an OO. His words have reached some interested Amateurs who have demonstrated a desire to help serve the radio community by requesting the needed study materials to prepare them for the OO test. If you have any questions or requests of Marty you may contact him at "MAGJSG@junco.com". I would like to thank the Chatham RACES organization, the Tri County Club and the New Providence Club for being such great hosts and inviting me to share some time and ideas. A special thanks is due the Rutgers' Amateur Radio Club and its advisors for assistance in providing a place for a group concerned with Local Repeater coordination to meet and prepare as needed to incorporate. I hope to be able to report more advances in this area in the near future. Another recent highlight for the hobby was provided by Brian Baccardi, N2MPM, who was an invited speaker at the Middlesex College October Computerfest. Brian's topic was "Amateur Radio's involvement with computers." As part of his presentation, he along with Paul Toth, KB2WNZ, SEC, gave the audience a live APRS demonstration. Paul, along with other League-minded amateurs, also hosted an ARRL booth at the exhibit for the entire two days. Dave Struebel, WB2FTX, reports that Kathleen Kazakwicz, N2ZKJ, has passed along the Net Manager position to Carl Lee, W2PTZ. Kathleen, it appears, is moving to Colorado. Good luck and many thanks, Kate. Hope to continue to visit with you via the airwaves. Many thanks to Carl whose experience and expertise will continue to benefit the Net. Another NTS active operator is Stew Tannahill, KB2VVB, who is to be congratulated for his appointment as an Official Relay Station. The annual Traffic Handlers' Confab is scheduled for Saturday, December 6 at the College of New Jersey in the Trenton Area. Sept 1997 NJ Section Traffic Manager Report

Net	Mgr	Time	Freq	Sess	QNI	QTC
NJM	WA2OPY	1000	3695	30	246	89
NJPN	W2CC	1800	3950	34	215	30
NJSN	AA2HJ	1830	3715	30	168	9
NJN/E	AG2R	1900	3695	30	258	112
NJN/L	WA2SEI	2200	3695	30	175	29
CJTN	N3RB	2000	147.120	30	413	51
NJVN/E	N2ZKJ	1930	146.895	no report		
NJVN/L	N2OPJ	2230	146.490	30	220	53

Digital NTS activity: WB2FTX-4 packet/NTS hub 411 messages 2RN HF Digital NTS station: Originated 2 NTS, Received 83 NTS, forwarded 62 NTS. Tfc/PSHR: N1JX 146/132, N2OPJ 127/170, W2MTO 113/110, N2QAE 70/33, WA2SEI 54/142, N3RB 42/110, N2GJ 40/120, N2VOA 38/118, W2JG, 34/124, K2VX 29/63, AB2RE 26/156, W2CC 21/81, N2RPI 15/141, W2PTZ 10/—, N2TTT 10/35, WB2CZW 6/90, 73 de AB2RE.

MIDWEST DIVISION

IOWA: SM, Jim Lasely, N0JL @ KE0BX—ASM: N0LDD, SEC: NA0R, ACC: N0JLP @ KE0BX, BM: K0IIR @ W0CXX, SGL: K0KDD, TC: W0DIA, Ottumwa did the Oktoberfest parade again. Pretty much the usual bunch doing the usual thing. It went very well, but new blood is always nice. Good job gang. I notice several IA calls in the FD results again this year. Also notice some missing. CAARC has new officers, N0ZAK, KB0YVK, KA0RHZ, and NY0E is on the board. FMARC has new ones too. N0NP, W0BO, and KA0YAP. Congrats. CVARC is looking for a public service coordinator. If you are in the CR area and want to help, give 'em a call. Great pay, too. Mason City had a chili supper with lots left over (a tablespoon!). The QCATV club had a hidden XMTX hunt. Could the XMTX see them coming? ACRS has a reprint from the ARRL website on lightning. Take a look. Lots of public service listed this month. DARC did the fire cracker run. DMRAA reports on the MS150, SARA did an airshow and reports on a traffic accident in Sooland. CIRAS did the October parade. CIRAS also reports a code class on the 147.135 repeater. Winter is a good time to upgrade. LDD is working on Advanced and YMO is striving for General. Can't get the rest interested—yet. Sorry I didn't make it. DSM for the hamfest. I was in Denver. Truly need an STM. I need someone who can collect reports on SSB from both individuals as well as local nets. I will also give you a traffic count to report to the SM! If I missed your activity, call and yell! I apologize in advance. This has been a very hectic month. Use a mode you haven't been using! Newsletters were received from OARC, CAARC, CVARC, FMARC, NIARC, DRAC, ACRS, DARA, DMRAA, CIRAS, IARC Traffic: W0SS 138, N0JL 31.

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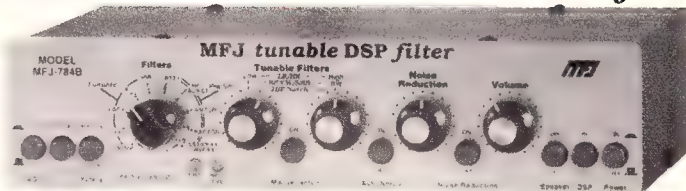
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Automatic notch filter

MFJ's automatic notch filter searches for and eliminates multiple heterodynes in milli-seconds. It's so fast, that even *interfering* CW and RTTY signals can also be eliminated.

You can *selectively* remove unwanted tones using the two *manually tunable* notch filters -- an MFJ exclusive. Knock out unwanted CW stations while you're on CW.

Adaptive Noise Reduction

Noise reduction works in all filter modes and on all random noise -- white noise, static, impulse, ignition noise, power line noise, hiss.

The LMS algorithm gives you up to 20 dB of noise reduction. Noise reduction is adjustable to prevent signal distortion.

15 pre-set filters -- factory set or you custom program

You can select from 15 *pre-set* filters. Use for SSB, AM, CW, packet, AMTOR, PACTOR, RTTY, SSTV, WeFAX, FAX or any mode.

If you don't like our pre-set filters, you can program your own -- *an MFJ exclusive!* Save center frequency/bandwidth, lowpass/highpass cutoffs, auto/manual notch, noise reduction -- all filter settings -- in 10 *programmable* filters.

Plus more . . .

A push-button bypasses your filter -- lets you hear the *entire* unfiltered signal.

2 1/2 watt amplifier, volume control, input

level control, speaker jack, PTT sense line, line level output. 9 1/2 x 2 1/2 x 6 inches.

Plugs between your transceiver or receiver and external speaker or headphones. Use 12 VDC or 110 VAC with MFJ-1315, \$14.95. Cable Pack, MFJ-5184, \$7.95, includes receiver cable, DC cable, 2 open-end TNC cables.

New Features

MFJ's exclusive *tunable Spotting Tone™* -- accurately tunes even the narrowest CW filter.

MFJ's exclusive *Adaptive Tuning™* -- tuning rate automatically becomes finer as you narrow bandwidth -- makes narrow filters easy-to-use.

MFJ's exclusive *FilterTalk™* -- sends precise filter settings in Morse code.

Has automatic notch with *variable* aggressiveness, new quieter 2 1/2 watt audio amplifier, new speaker switch keeps phones always active.

Manual and automatic notch can be used together. Noise reduction, automatic notch and tunable manual notch can be used when a custom filter you saved in memory is selected.

You get an accurate easy-to-use input level indicator, improved manual notch in the CW mode, adjustable line level output, more Mark-Space frequencies and baud rates for data filters and auto-matic bypass during transmit for monitoring CW sidetone, voice or data by sensing the PTT line.

Firmware Upgrade

For MFJ-784, order MFJ-55, \$29.95. Gives you most features of the MFJ-784B.

NEW! 60 dB Null wipes out noise and interference

MFJ-1026
\$159⁹⁵



Wipe out noise and interference *before* it gets into your receiver with a 60 dB null!

Eliminate all types of noise-- severe power line noise from arcing transformers and insulators, fluorescent lamps, light dimmers, touch controlled lamps, computers, TV birdies,

lightning crashes from distant thunderstorms, electric drills, motors, industrial processes . . .

It's *more effective* than a noise blanker because interference much stronger than your desired signal can be completely removed without affecting your signal.

It works on *all modes* -- SSB, AM, CW, FM -- and frequencies from BCB to lower VHF.

You can null out strong QRM on top of weak rare DX and then work him! You can null out a strong local ham or AM broadcast station to prevent your receiver from overloading.

Use the MFJ-1026 as an *adjustable phasing network*. You can combine two antennas to give you various directional patterns. You can null out a strong interfering signal or peak a weak signal

at a push of a button.

Easy-to-use! Plugs between transmitting antenna and transceiver. To null, adjust amplitude and phase controls for minimum S-meter reading or lowest noise. To peak, push reverse button. Use built-in active antenna or an external one. MFJ's exclusive *Constant Amplitude Phase Control™* makes nulling easy.

RF sense T/R switch automatically bypasses your transceiver when you transmit. Adjustable delay time. Uses 12 VDC or 110 VAC with MFJ-1312B, \$12.95. 6 1/2 x 1 1/2 x 6 1/4 inches.

MFJ-1025, \$139.95. Like MFJ-1026 less

built-in active antenna, use external antenna.



Add DSP to any Multimode DSP for your MFJ-1278/B

MFJ-780
\$99⁹⁵



Plug a MFJ-780 "brick wall" DSP filter into your MFJ-1278/B multi-mode and you won't believe your eyes when you see solid copy from signals completely buried in QRM! MFJ-1278/B *automatically* selects the correct DSP filter for Packet, AMTOR, Pactor, RTTY, ASCII, FAX, Color SSTV, Navtex or CW.

Plug in a MFJ-780 and copy signals that other multi-modes can't. Some soldering needed.

Add "brick wall" DSP filtering to *any* TNC or multi-mode data controller.

Copy signals buried in noise and QRM.

Under severe QRM, DSP greatly improves copy

of Packet, AMTOR, PACTOR, GATOR, Clover, RTTY, SSTV, WeFAX, FAX, CW -- nearly any digital mode. Automatic gain control, ON/OFF/Bypass switch. Plugs between transceiver and multi-mode. Uses 10-16 VDC or 110 VAC with MFJ-1312B, \$12.95. 4 1/2 x 2 1/2 x 5 in.

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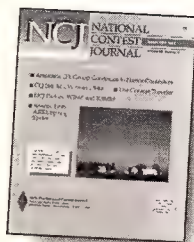
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KANSAS: SM, Mike Brungardt, K0TQ—SEC: Joe Plankinton, WD0DMV. STM/ASM: Orlan Cook, W0OYH. ACC/OCC: Bob Summers, K0BXF. SGL: Marshall Reese, AA0GL. Joe, WD0DMV, reported at the section meeting during the convention this year of a very small number of reports from the districts in the state. Joe works with the state and is often asked of amateur operators in different areas of the state and is unsure of a lot of his information. This is vital information that must be kept up to date for very quick reference. I urge all DEC's to collect any kind of a report from your EC's and get them sent to Joe. Even if the only activity to report is the usual nets, please get those reports in. My first few months of being section manager began in October of last year and has been a very interesting, joyful and learning experience. Now it looks that my work may require us to relocate to a new QTH. Nothing definite yet, but if we quickly disappear this will be the reason. When this happens, I will ask my assistant Orlan, W0OYH, to take over for a short time pending further plans. If things do not work out with the job, then we'll look forward to a very prosperous new year with hopefully more organization and more frequent meetings within our section. I've really enjoyed working and meeting all of the hams we have here in Kansas. Until next month, the very best of 73 de K0TQ, SM. Tfc: W0OYH 128, W0ZNY 103, K0RY 36, KB0DTI 26, KX0I 24, W0FT 20, K0TQ 11, NB0Z 5.

MISSOURI: SM, Roger Volk, K0GOB—Because of my business travel schedule, Tom, K10JO, has been collecting the net reports, the PSHR info and the SARs and forwarding them to me via e-mail so that I can write this column from any hotel in the country. To recognize his past contributions and to allow him to pick up additional assignments as they come along, he has been appointed an Assistant Section Manager. You can find Tom on the MOTRAN at 5:45 PM local on 3963 KC or he can be reached at his e-mail address at k10jo@laurie.net. He is also active on Packet and his mailbox is K10JO@N0LBA.#CEMO.MO. When you see him at future hamfests, thank him for his efforts on behalf of the section. I just got back from the Warrensburg hamfest and want to thank all of the League members that stopped by the ARRL booth to say hello. Their Legion Post serves up an excellent breakfast and lunch for the event and I want to thank the club for their hospitality while I was in the area. I started to list the clubs that actively participated in the MS150 bike ride, but the list overwhelmed the space allocated. Many hams passed up the Columbia hamfest to provide communications for the event. Now that's dedication to the public service aspect of ham radio. Repeaters are expensive to build and maintain. And, each machine "belongs" to someone or group. During the MS150, many repeater owners allowed their machines to be used for extended periods of time. Thanks! By the time you read this, Jim, K0BMB, should be back in his home after a lightning induced fire did extensive damage. Old man Murphy must have been sleeping at the time because the lightning missed his tower and ham equipment. Have a Merry Christmas and a Happy New Year! Nets: MOTRAN 30/564/116 K0IPM; STLPRTR 5/118/7 K0WEX; PAULREVERE 4/448/0 N0IWA; K0YML; HAMBUTCHERS 22/767/96 WL7YM; MON1&2 60/167/52 W0OTF; ROLLABB 30/447/11 NA0V; KCABARC 5/177/5 KA0SSE; WAARCI 4/95/0 WE0G; AUDRAINARC 3/21/2 W0BSEN; CARL 3/43/1 K0OMV; WJACKCOARES 4/23/0 K0UAA; GOBNET 30/225/24 WL7YM. Tfc: K10JO 131; K0AH 105; W0OTF 87.

NEBRASKA: SM, Bill McCollum, K0XQ—ASMs: W0KVM, N0MT, W0ULH, WY0F & W0YWO. The Midway ARC (Kearney) will be sponsoring a Hamfest on Jan. 10, 1998 at the Buffalo County Extension Building in Kearney. Contact W0PXD for further information. Congratulations to Pine Ridge ARC member K0QAL for winning QSO parties in Texas, VA and the CHC contest. Carl, KB0KDO advises me that the Tangier Masonic Amateur Radio Club has formed in Omaha. One must be a Shriner to belong. The club plans on being affiliated with the ARRL. This will bring the number of affiliated clubs to 20 in the state. Congratulations to Reynolds, K0GND, for being appointed DEC for Eastern Nebraska. KFOMS has resigned as NM for the Dodge County ARS Net. Replacing him is N0LGU. Thanks, Steve, for your work! On October 8, Midwest Division Director K4VX presented a cover plaque to Tom Spann, W0HBR, for his article on the FCC Grand Island Monitoring Station which appeared in the November 1996 QST. After the presentation, W0HBR showed a videotape of the monitoring station, 9 members of the Elkhorn Valley ARC participated in a disaster exercise in September. Tfc: K0PTK 97, W0CO 35, K0EXQ 30, W0EXK 4, WY0F 2, W0OR2, A0KQ2, K0MS2, KA0DOC2, K0FO1. PSHR: KA0DBK 80, KB0YTM 51.

NEW ENGLAND DIVISION

CONNECTICUT: SM, Betsey Doane, K1EIC—ASMs: KZ1Z, KB1H, NK1J, K1STM, N1API; ACC WA1CBW. BM: KD1YV. OOC: W1FAI. PIC: W1FXQ. SEC: N1IU. SGL: K1AH. STM: K1HEJ. TC: KA1KJZ. I am writing this just a few hours after having returned from the CT State Convention in Durham. It really was lots of fun—plenty to look at and lots of friends to see! It was nice to see the forums so well attended. The Meriden ARC and Middlesex ARS worked tirelessly for the benefit of all of us. And folks, the weather surely cooperated! It was a real pleasure for me to present the Charter of Affiliation to Al, N1JWF, who received it on behalf of The Plainville Amateur Radio Club. PARC, as they are known, has participated in a number of public service events. Many thanks to John Hennessee, N1KB, of ARRL, for giving his well-received talk on Amateur Radio regulations. A big thank you to all of the speakers, VEs and to those who gave special demonstrations. And my thanks to all of you for your continuing support and encouragement. The Simulated Emergency Test was certainly a busy weekend for many ops in CT. Happily, this year we had several newly licensed participants become involved in this annual exercise. Congratulations to Harry, N1JTL, EC of Hartford, and all those who worked with him on a successful exercise with Hartford Hospital. Working with other agencies in emergency preparedness demands a significant effort and a lot of planning. Harry's group was invited to participate in this drill! Great job! This season will continue to be a busy one—I will be speaking at The Insurance City Repeater Club and will join Director Frenay at

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"Tried another course for 2 months knew only half of the alphabet. Our ham club president asked me to try CQ. Today I passed my 20! It's marvelous!" MB DG9JN

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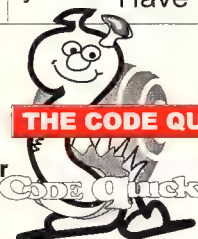
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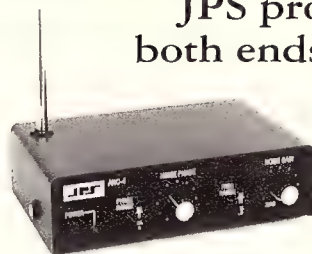
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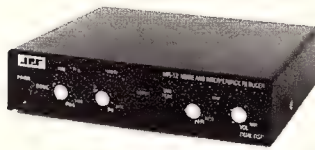
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the Candlewood ARA in the next couple of months. Phil, KA1YIQ, and John, N1OLO, of FARA have been working with the Discovery Museum in Bridgeport and have installed an Amateur Radio station there. More to follow on this continuing exhibit as details become available. Clubs are of course planning their holiday parties at which I hope to see some of you as my time permits. Speaking of holidays, best wishes to all of you from all of us on the section cabinet for a very happy and safe Thanksgiving. Net sess/QNI/QTC: NVTN 29/179/106; WESCON 30/400/156; RTN 29/188/56; CPN 30/221. Ttc: NM1K 2501, KA1VEC 699, K1EIC 543, WA4QXT 319, K1HEJ 310, KA1GWE 248, N1VXP 164, N1NYJ 52, N1YVV 35, KE1AI 18, W1GPS 5.

EASTERN MASSACHUSETTS: SM, Larry Ober, W1MW—ASMS: WA1IDA, AA1FS, KE1BG, N1GTB, N1UGA, N1SGL. ACC: Open. BM: N1IST. OOC: K1LJN. PIC: N1PBA. SEC: W3EVE. K3HI. STM: WA1TBY. TC: W3EVE. EMA ARRL: voice: 508 263-2498. Packet bulletins: ARRL@EMABBS. E-mail: w1mw@arll.org. e-mail list: ema-arll@netcom.com. Web: <http://www.qsl.net/ema-arll>. Two of my Field Day photographs graced the cover of November's QST. The shot of Bob Melvin, WT1O, instructing a potential Novice was incorrectly captioned in QST. It was taken at the combined Barnstable ARC and Sandwich ARC site at the Cape Cod Canal. Lew Collins, W1GXT, has put together a talk on compliance with the new FCC mandated RF safety guidelines. Don't miss this important presentation. Invite Lew to your club ASAP. The new guidelines are effective 1-1-98! The Algonquin ARC is holding a CW practice net on the 446.675 repeater Sundays at 7:00 PM and is considering starting a RTTY net on the Novice/Tech+ portion of 10 M. Nashoba Valley ARC provided Emergency Communications Support for the New England Regional Soccer Tournament on Columbus Day weekend. They also helped clean up a section of Rte 119 under the "Adopt A Road" program. It's good PR as sponsors get credit on highway signs. Brooms and shovels anyone? Sturdy Memorial Hospital ARC has held a pre-holiday dinner November 8. Whitman ARC operated a special-event station, WA1NPO, at the Marshfield Fair which helped generate interest in their September licensing classes. Quanaopowit RA continues to sponsor VE sessions in conjunction with Melrose ARES the 3rd Saturday at the First Baptist Church in Melrose. Framingham ARA has rescheduled their License in a Weekend class to November. South-eastern Mass ARA reports that the Fairhaven Repeater Weather Net held its fall meeting in October. A meteorologist from the National Weather Service in Taunton on was the featured speaker Don Haney, KA1T, will speak on the Pilot Program for Special Service Clubs at the November 20 Wellesley ARS meeting. Boston ARC assisted WGBH public television and radio at their annual Ice Cream FunFest fundraiser. Congratulations to those sporting new calls under Gate 3 of the Vanity Call Sign Program. The Second Commandment of Electrical Safety: "Cause thou the switch that supplieth large quantities of juice to be opened and thusly tagged, that thy days may be long in this earthly vale of tears." 73 de W1MW. Ttc: N1OTC 1067, WA1TBY 225, WB2EAG 169, N1LJK 129, WA1FNM 81, KB1AF 60, WA1LPM 55, KA1WGL 42, N1ZFF 38, N1SGL 38, N1IST 32, K8SH 29, N1TDF 28, N1LAH 27, N1XYS 27, N1AJJ 18, KA1VAX 12, K1SEC 12, KB1EB 9, KA1BBU 8, N1XQC 7, KA1YLC 5, N1TPU 2.

NEW HAMPSHIRE: SM, Al Shuman, N1FIK (BBS@WA1WOK)—ASMS: WB1ASL, W1NH, N3CLZ, W1JS, N1FIL, N1KIM. ACC: NA1E. STM: WA1JVJ. BM: KH6GR. OOC: W1GTA. TC: WA1HOG. SEC: WB1ASL. SGL: K1KM. PIC: KA1GOZ. Pleased to announce Dennis Hennigan, WA1HOG, has been appointed as the Technical Coordinator for the NH Field Organization. Dennis, a test engineer, has over 18 years in the EMI/EMC/RFI, products field. Dennis assumes the reins from Johnny Johnson, W1JY, who retired earlier this year. It is with great sadness that I inform you of the passing of James Thayer, W1FZ, of Farmington. It is not often that I dedicate a major portion of my column to one topic. However, in this case, it is appropriate. Jim died tragically on Oct 7. Jim, a lifetime member of the ARRL, was also an Elmer for the GBRA. Jim, 90 yrs, was a ham for over 75 yrs. His commitment to Amateur Radio and his community was unwavering. Jim, an avid DXer who held DXCC with contacts for all countries, purchased HF radios for each student who received a license in the Farmington School system. The GBRA has used his property for Field Day for many years. Jim was the President of the Farmington National Bank, President of the Union Telephone Co, Selectman and member of the Farmington school committee. Donations in Jim's memory should be made to the Farmington Public Library. Jim will be greatly missed. 73, Al. Net/Sess/QNI/QTC/QTR: GSFM 30/427/107/840; GSFP 34/178/39/335; TSEN 4/55/2; VTNH 30/185/118/486. Ttc: W1FYR 1580, W1PEX 641, K1TQY 235, WA1JVJ 153, WB1GXM 122, N1KPT 91, N1CPX 85, W1ALE 74, AA1GD 62, N1NH 52, K1ZO 30, KA1OTN 28, AE1T 22.

RHODE ISLAND: SM, Rick Fairweather, K1KYI—e-mail k1kyi@juno.com—ASM: N1JFY. ACC: AA1CE. STM: WA1CSO. SEC: N1JMA. OOC: W1AOM. TC: KA1EGY. BM: KA1BNO. SGL: NN1K. Hope you all enjoyed the holiday season this year. This time of year always builds lots of message traffic for the nets. K1TPK, a dedicated traffic handler sidelined by illness, is missed a great deal on the traffic nets in RI. Why not get on and lend a hand on 147.36 Monday thru Saturday evenings at 8:30 PM local time during this busy time of year and help fill the void left by Manly's absence. Our dedicated group of traffic handlers gave RI 100% representation on the FRN again during September. Congrats! Make sure to keep me informed of your club's activities by keeping me on the mailing lists. Speaking of newsletters, the Amateur Radio News Service is sponsoring their annual newsletter contest. Call me for details if you want to enter your club's newsletter. As of mid-October, only the Northern RI Radio Club has signed on to the ARRL's "Get on the air program." If you need details, give me a call. Congrats to W1AOM, our OOC, on his new call sign his old call was WA1ZFS. Ttc: WA1CSO 72, KA1JXH 45, K1KYI 7. PSRR: WA1CSO 126, KA1JXH 118.

VERMONT: SM, Bernie Capron, N1NDN—A search and rescue operation took place in Reading, VT, with all turning out well when the person was found at a friend's house. Nonetheless, several hams in the area participated in this

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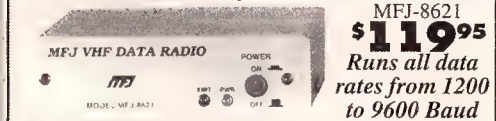
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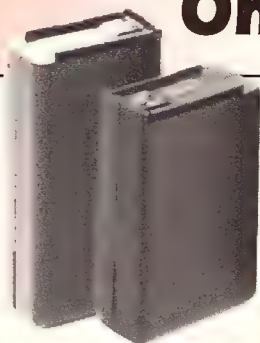
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situation. The Twin State Radio Club held another fox hunt with Bill and Dot Burden being the foxes. They hid in New Hampshire, but they were found anyway. Vermont's first 900 MHz repeater is on the air in Rutland. Thanks to Frank, W1AD, Brian, WA1ZMS, and others. Try it on 921.2 MHz. For those of you who are only on two meters, it is linked to the 147.045 repeater. Congratulations to Ryan Lilien, of Hartford, VT. He went from no license to General in one sitting. Wish N1ZSO congratulations when you hear him. Sessions/Checkins/Traffic: Vermont/New Hampshire Net (VTNH) 30/185/118; Vermont Phone Emergency Net (VPEN) 4/37/2; Green Mountain Net 26/887/40; Tri-State FM Emergency Net (Keene) 4/55/2; Public Service Honor Roll Stations: KT1Q 148, N1DHT121, Traffic: KT1Q *565, N1DHT 266, N2YHK 7; KA1YLN 6; BPL. Vermont had the following representation on 1RN: Cycle 2 - 88%.

WESTERN MASSACHUSETTS: SM, William C. Voedisch, W1UD, w1ud@juno.com. ASM: N1LZC. ASM (Digital): KD1SM. STM: W1SVJ. SEC: K1VSG. OOC: W1TW. It was great to see so many WMA people at the "Horsetraders" meet. Everyone was having a good time looking at equipment displayed for sale. The traffic nets are going well, but I would like to see more different stations checking in. Try WMN on 3562 at 7 PM local Mon, Wed or Fr. Check in at your comfortable operating speed. The net will adjust to your speed. The results of Field Day are out. It's encouraging to see so many clubs participating. Didn't look at the scores as FD is not a contest. The ability to set up for emergency operation is all that counts. I also discovered that we have four clubs that I cannot account for. They are in WMA, but I can't find any other info. I'd appreciate info either by packet, e-mail or a phone call. VEs, your job is not done when you examine and pass an applicant. Make sure he or she gets on the air and joins a club! Clubs should have Elmers ready to help these "youngsters." Statistics prove that 50% of these people will drop out of ham radio if they are not on the air within a year. These figures are unacceptable! Congrats to the operators at the Big E message fair. 5K pieces of traffic was handled by that crew! Tlc: KD1SM 24, W1ZPB 46, W1SVJ 30, KD1XP 30, N1KXL 21, N1VHB 2443, W1KK 2593, N1SB 22, W1UD 291.

NORTHWESTERN DIVISION

EASTERN WASHINGTON: SM, Kyle Pugh, KA7CSP—SEC: WA5ZAY. STM: W7GB. OOC: KB7HDH. SGL: WB7UEU. TC: N7TOF. ACC: KA2LCC. From the sound of things it appears that sunset Cycle 23 has begun. According to George Fitzpatrick, W7LKR, of Pomeroy the Solar Flux hit 100 on Sept. 7, first time since Feb 24, 1994. There have been some openings recently on 10 and 12 meters, some good news for propagation. In September, 11 people volunteered 174 hours helping at the Klickitat County Fair representing the Klickitat and Wasco counties ARES and the Mid-Columbia ARC. And in cooperation with the Spokane American Morse Telegraphy Club, Gordon Grove, WA7LNC, and Don Felgenhauer, K7BFL, generated over 100 messages from the Spokane Interstate Fair. On Oct. 4, 33 Spokane area hams participated in a Simulated Emergency Test (SET), which included several stations in WWA and N Idaho. Sorry to report Charles Dyer, K7RZE, as a Silent Key. Season's Greetings to everyone. Tlc: W7GB 321, K7GXZ 289, KA7EKL 105, K7BFL 104, W7UVP 38, KK7T 18. PSNR: W7GB 139, K7GXZ 134, W7UVP 73.

IDAHO: SM, Mike Langrell, AA7VR—OOC: N7HGV. SEC: K17EP. STM: W7GHT. There were lots of activities this month. We just finished the 1997 Section Emergency Test, and it was a lot of fun working all of you. It's kind of nice to make contacts with hams in all of the counties in Idaho. I wish we had more time. 73, Mike, AA7VR. Tlc: W7GHT 207, KB7GZU 71, WB7VYH 70, and N7MPS 9. PSNR: W7GHT 122, WB7VYH 106, N7MPS 50. Net Sess/QNI/QTC/Mgr: FARM 30/225/143/N7EZQ; NWTN 30/193/46/KC7RNT; IDACD 23/518/12/K7UBC; IMN 30/286/117/WB7VYH.

MONTANA: SM, Darrell Thomas, N7KOR—The Capital City Amateur Radio Club of Helena has announced a special-event station on November 8th. This will be to highlight the club's 50 years of affiliation with the ARRL. It is also the anniversary of Montana statehood. They will be operating from the state capital and hope to have the governor and other state officials attend the site. We hope many had the opportunity to work this station. The Yellowstone Amateur Radio Club of Billings has won the trophy for the most non-ham visitors at a Field Day site for the second year in a row. Congratulations to them. I had the pleasure of meeting Al Brodgon, W1AB, retired features editor from QST in Helena on September 13. He and his XYL were on an extended trip following his retirement and had stopped in the Helena area and were attending the weekly Saturday breakfast meeting. Sure hope he and his wife enjoyed their visit to Montana. I wish to extend Best Holiday Wishes from myself and my wife to all and hope you have a very Merry and safe Holiday Season. Net/QNI/QTC/NM MSN/97/0 W7OW; MTN/1688/72 N7AIC; IMN/286/117 WB7VYH.

OREGON: SM, Randy Stimson, KZ7T—ASM: W7FBP. ASM: KF7KE. ASM: KG7OK. ASM: N7QQU. STM: W7VSE. SEC: WB7NML. PIO: KC7YN. SGL: KA7KSK. ACC: AA7OA. STC: N7HVM. OOC: NB7J. Sorry for missing last month, but Cycle Oregon is the reason. Speaking of Cycle Oregon, it was one of the toughest communications weeks that I have ever had. Things that should have worked didn't, and I really don't know why. It has to do with the terrain. We were on the highest points as usual, but they wouldn't work. We had to have two of us on two high points for four of the seven days. There was one primary net with a backup net. We used cross band so that one net could deal with the hams on the SAG wagons. What we did was have two simplex frequencies where the hams would use one from start to lunch and switch to the other after lunch. The reason for simplex is we need to talk to the Oregon State Police, ambulances and 25 commercial mobiles for staff. So we did the entire event simplex. This way the primary net would listen on 440 and two meters and could talk to all of the hams on the SAG wagons. A SAG wagon is a 10 passenger van with a bike rack on it. They will pick up tired, injured riders and riders with bike problems and transport them. Cycle Oregon is a tour event with 2000+ riders riding around Oregon, and it is a week-long event. It covers up to 500 miles. There were 15 hams involved, 7 of which were on

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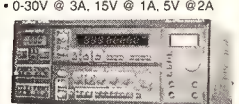
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Boost your 2 Meter handheld or multimode (like ICOM 706) to a super powerful 100 watts... All modes: FM, SSB, CW... 15 dB GaAsFET receive preamp... Reverse polarity protection... Silent cooling fan... Free HT-to-amp coax and mobile bracket

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B-310-G Suggested Retail



Polarity Protection can save your amp if you connect power backwards.

Compact but Powerful

Mirage's integrated HeatsinkCabinet™ and whisper quiet fan gets heat out fast!

The results? An ultra-compact 4 3/4 x 1 3/4 x 7 3/4 inch 2 1/2 pound amplifier that delivers a super powerful 100 watts.

Free Accessories

Free 3 foot handheld to B-310-G coax cable -- just plug and play! Free mobile bracket! Free rubber mounting feet for home use!

Plus more...

Automatic RF sense Transmit/Receive switch. Remote keying jack. LEDs monitor "On Air", high SWR, pre-amp, power. Push buttons select SSB/FM, pre-amp, power. Draws 15 amps at 12-15 VDC.

Full one year MIRAGE warranty

With Mirage's legendary ruggedness, you may never need our superb warranty.

Power Curve -- typical B-310-G output power

Watts Out	25	50	75	95	100	100+	100+
Watts In	1/4	1/2	1	2	4	6	8

For an incredibly low \$199, you can boost your 2 Meter handheld to a super powerful 100 watt mobile or base!

Turn "You're breaking up... Can't copy" into "Solid Copy... Go ahead."

Talk further... Reach distant repeaters... Log onto faraway packet bulletin boards.

This rugged Mirage B-310-G amplifier

operates all modes: FM, SSB and CW. It's perfect for all handhelds up to 8 watts and multi-mode SSB/CW/FM 2 Meter rigs.

It's great for the ICOM IC-706 -- you'll get 100 blockbuster watts on 2 Meters!

Low noise GaAsFET pre-amp

A built-in low noise GaAsFET receive pre-amp gives you 15 dB gain -- lets you dig out weak signals.

Fully Protected

SWR Protection prevents damage from antennas whipping in the wind. Reverse

Dual Band 144/440 MHz Amp

at the same time -- just like a telephone conversation! (Requires compatible HT)

Mirage is the Best! Here's why...

• Automatic frequency band selection -- you'll never forget to switch bands

• Single input connector and single output connector for both bands -- easy to use with dual band radios and antennas

• First-class strip-line techniques -- superb RF performance and reliability

• Custom wrap-around heatsink -- runs cool

• Reverse Polarity Protection -- saves your amp if you connect power backward

• Automatic RF sense Transmit/Receive switch -- makes operation easy

• Low input SWR -- keeps your handheld safe from overheating

• "On Air" LEDs -- for each band

• Free mobile mounting bracket

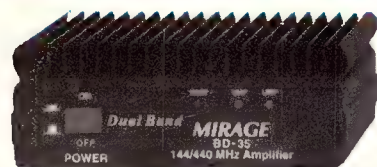
• Free 3 foot handheld-to-BD-35 coax cable

• Small size: just 5x1 1/4x5 inches

• Full one year MIRAGE warranty

• Legendary MIRAGE ruggedness

Call your dealer today for your best price!



\$159.95

BD-35 Suggested Retail

Power Curve -- typical BD-35 output power

Watts Out (2Meters)	30	40	45	45+	45+	45+	45+
Watts Out (440 MHz)	16	26	32	35+	35+	35+	35+
Watts In	1	2	3	4	5	6	7

Add this Mirage dual band amp and boost your handheld to 45 watts on 2 Meters or 35 watts on 440 MHz!

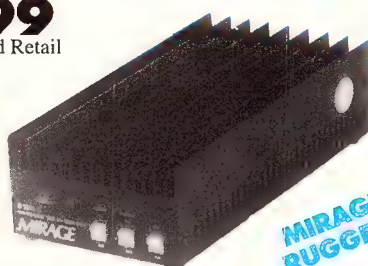
Works with all FM handhelds up to 7 watts. Power Curve chart shows typical output power.

Full Duplex Operation

Mirage's exclusive FullDuplexAMP™ lets you talk on one band and listen on the other band

160 Watts on 2 Meters!

B-5016-G
\$299
Suggested Retail



MIRAGE RUGGED!

Power Curve -- typical B-5016-G output power

Watts Out	130	135	140	145	150	155	160	165
Watts In	20	25	30	35	40	45	50	55

The MIRAGE B-5016-G gives you 160 watts of brute power for 50 watts input on all modes -- FM, SSB or CW!

Ideal for 20 to 60 watt 2 Meter mobile or base. Power Curve chart shows typical output power.

Hear weak signals -- low noise GaAsFET preamp gives you excellent 0.6 dB noise figure. Select 15 or 20 dB gain.

B-5016-G has legendary ruggedness. We know of one that has been in constant use since 1979!

Heavy-duty heatsink spans entire length of cabinet -- prevents overheating. Power transistors protected by MIRAGE's Therm-O-Guard™.

Fully protected from high SWR and excessive input power. Has warning LED.

Has smooth adjustable Transmit/Receive switching with remote external keying.

RC-1, \$45, Remote Control. On/Off, pre-amp On/Off, selects SSB/FM. With 18-ft cable. Draws 17-22 amps at 13.8 VDC. 12x3x5 1/2 in.

35 Watts for 2 Meter HTs

B-34-G
\$89.95
Suggested Retail



Power Curve -- typical B-34-G output power

Watts Out	18	30	33	35+	35+	35+	35+	35+
Watts In	1	2	3	4	5	6	7	8

• 35 Watts Output on 2 Meters

• All modes: FM, SSB, CW

• 18 dB GaAsFET preamp

• Reverse polarity protection

• Includes mobile bracket

• Auto RF sense T/R switch

• Custom heatsink, runs cool

• Works with handhelds up to 8 watts

• One year MIRAGE warranty

35 watts, FM only... \$69.95

B-34, \$69.95. 35 watts out for 2 watts in. Like B-34-G, FM only, less preamp, mobile bracket. 3 1/2 x 1 3/4 x 4 1/4 inches.

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B-2516-G, \$299. For 10 to 35 watt mobile or base stations. 160 watts out for 25 watts in.

B-1016-G, \$379. MIRAGE's most popular dual purpose HT or mobile/base amplifier. 160 watts out/10 W in. For 0.2-15 watt transceivers.

B-215-G, \$379. MIRAGE's most popular handheld amp. 150 watts out/2 watts in; 160 watts out/3 1/2 W in. For 0.25 to 5 watt handhelds.

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Chuck Burch, AH6IN. TC: Kenny Bell, KH6AFQ. Please promote ARRL membership and consider volunteering your services. BIARC had a booth at the Hawaii County Fair Sep 17-21. Hilo had mainland visitors: Jim, KC7OKZ, Carol, KC7TSX, both on the s/v "Morning Wings." Klaus-Peter DL3SJ/KB6DNJ, Bud AH6NZ, formerly Glenwood and visiting from Tampa FL. HI QRP Club had a camp/outing at Laupahoehoe Point Beach Park Sep 26-28. Participants: WH6CQA, WH6AVF, WH6XJ, KH6CC, KH6AFQ, K6REH, NH6WW, NH6WX, AH6NK, KH6AFS, AH7H, KH6DFW, ex-KH6HDC, KH6B. Please consider participating in local nets:

Hawaii Afternoon Net	0200 UT	7088/3888
Pacific Interisland Net	0800 UT	14315
Friendly Net	1900 UT	3860
Hawaii ARES - 1st Thu	0500 UT	3905
HI QCWA - 1st Mon	0100 UT	7088

Mahalo, 73 and Aloha.

SACRAMENTO VALLEY: SM, Jettie Hill, W6RFF—As the year ends reflect back on the enjoyment and friendship that Amateur Radio has brought you, and resolve to put something back into it by helping your club, acting as an "Elmer," teaching classes or giving exams. K6WR & W6CF will continue as Director & VD of Pacific Div for another 2 years. The weatherman predicts heavy rains this winter, so become acquainted with your Emergency Coordinator and ARES group. They may need your help! KB6HP, former editor of *Worldradio*, spoke on "State of the Art for Amateur Radio" before the Sacramento ARC. Three Sacramento Valley clubs were competing in the Calif QSO Party; they are Mother Lode DXCC, Shasta DXCC and River City Contesters. Did one of them win? Stay tuned. River City ARCS had a demonstration of QRP rigs at their meeting. RCARCS has VE tests on Dec 20—483-3293 for info. VE test in Sacto. Dec 14-383-2113 for info. Anderson VE Dec 13—call 357-4834. GEARS Dec 7-call 342-1180. Nevada County ARC Dec 13—273-0524. SEC K6BZ reports a station has been installed at CDF HQ in Redding. Jerry also set up a section-wide Simulated Emergency Test during Oct. Much action by the different ARES groups in preparing for possible flooding this winter. He also is writing a six-part series on Emergency Communications. Long time ham Harold Cobb, W6KDJ, is a Silent Key. GEARS newsletter had an excellent article on building a Delta Loop antenna by Dennis, AB6QR. The Sacramento Valley Section Net meets on 146.085+ at 8 PM, the first Sunday of each month. The latest ARRL & FCC news is given & there is a question/answer and comment period. All are welcome. Get your list in to Santa for that new rig or equipment. 73, Merry Christmas.

SAN FRANCISCO: SM, John Wallack, W6TLK—ASM: N6KM. OOC: KB6HQ. SEC: WB6TMS. STM: AB6EU. TC: N1AL. New appointments: KE6FEF, EC for Arcata: K6BMZ, EC for Fortuna: KM6TE, EC for Garberville. Thanks to all ARRL members who supported me in the recent SM election. I am going to continue to emphasize and support all ARRL affiliated clubs in the SF Section. It is through our local radio clubs in providing both emergency and public service communications that we can best support our fellow hams and serve our communities. K6ZWB, Sonoma County RA, reports an excellent turnout at the annual flea market. Congrats to Willits ARS member KE6SPJ who, along with her daughter, climbed 10,457 ft Mt Lassen. KN6ZU, Southern Humboldt ARC, reports that KA6ROM, N6AFT and KE6KKJ installed a new repeater on 146.355 (103.5). KE6CQJ reports that Lake County ARS has adopted a 4 mile stretch of Hwy 29 near Lakeport. WA6MLG, KB6CJA, KD6LAG, KB6ALT, KE6HMA, K6TCP, WA6CQI and N6GJM all helped pick up litter along the hwy on a hot day. This adds new meaning to public service and an excellent idea for a ham radio club. Well done to all! WA6TVQ reports that Humboldt ARC is 50 years old this year. Happy anniversary to all 120 club members! Tfc: AB6EU 272, KK1A 154.

SAN JOAQUIN VALLEY: SM, Donald Costello, W7WN — ASM: Mike Siegel, K16PR. ASM: Technical, John Lee, K6YK. SEC: Ernie Rader, W5NH. OOC: Victor Magana, AA6AH. Well, it seems that El Nino is the big topic of conversation these days and if predictions of a very wet winter hold up it is likely that there could be flooding again this year in the San Joaquin Valley. It is a good time for radio clubs to keep in touch with local municipalities, the National Weather Service and the Red Cross. It is also time to check out the generator in the garage and charge up those gel cells for possible action. Prepare for the worst and hope for the best. Are you ready for an extended power outage and lack of water and what about non-perishable food, etc. Think about it. If you are prepared, then you will be able to help others through Amateur Radio if the need should arise. Now that Advance license holders are applying for vanity calls, I am noticing many unique call signs out there. Some hams are picking call signs with their initials and some are just really creative. Rick McMillion (ex WB7UGZ) got this request for K6SIX. Good luck to all who request vanity call signs.

ROANOKE DIVISION

NORTH CAROLINA: SM, W. Reed Whitten, AB4W—ASMs: AB4S, KE4ML, KC4ACE. SEC: K4MPJ. STM: K4IWW. ASTM: W4EAT. TC: K4ITL. SGL: K4AN. OOC: W4ZRA. PIC: KN4AQ. ACC: W4CC. Check our Section Web Site for lots of NEW information <<http://www.ncarri.org>>! Field Day results showed many NC groups active. Orange County RA was, once again, first in 5A/Battery; Raleigh ARS was first in 7A; and Cary ARC was a very close second in 3A! The other groups that didn't score at the top of their class, were also winners. Fun and fellowship is the reward for the participants. The good public relations that Field Day gives the Amateur Radio Service is a reward that we all share. It is critical that the public perception be that Amateur Radio is an essential emergency communications resource. It is also important that Amateurs are viewed as "nice guys." Please remember, we are ALL ambassadors for Amateur Radio. If you have an Amateur Radio license plate, your courtesy on the road reflects on the Amateur Radio Service. If your call-sign is in your signature file and you are rude to others in your Internet postings, it reflects badly on all amateurs. A SPECIAL FORUM/SEMINAR, ESPECIALLY FOR CLUB OFFICERS AND ARES APPOINTEES WILL BE HELD AT THE GREENSBORO HAMFEST ON DEC 6. The discussions

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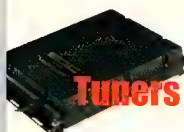
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Drive Power: 90 watts for 1,000 watts output
Tube: Amperex 3-500ZG triode (1)
QSK: Standard Feature (Vacuum Relay)
Line Voltage Requirement: 100/120/200/240V, 50/60Hz
Cabinet Size: 18" w x 15" d x 8-1/2" h
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Tubes: Amperex 3-500ZG triodes (2)
QSK: Standard Feature (Vacuum Relay)
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Model DX-B Single Wire Sloper for 160-80-40-30 Meters—Perfect for limited space use.

- Only 60' overall length.....**\$69.95 each**

Model DX-CC "No-Trap" 80-40-20-15-10 Meter Dipole—Can be used as inverted-V.

- Only 82' overall length.....**\$119.95 each**

Model DX-DD "No-Trap" 80-40 Meter Dipole—Can be used as inverted-V.

- Only 82' overall length.....**\$89.95 each**

Model DX-EE "No-Trap" 40-20-15-10 Meter Dipole (30-17-12 meters with wide-range tuner)

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will include: working with volunteers, improving your organization, using Internet and other means to communicate with your members and the public, and working closer with other Amateur and government groups. Our ACC, SEC, PIO, and several emergency agency personnel will lead the group discussion. This will be a first—don't miss it. We also plan to have one of the new North Carolina Em Mgt Amateur Radio vans at this hamfest. These vans illustrate the high esteem and trust that Amateur Radio has earned in North Carolina. We are fortunate to have an activity we enjoy that allows us to make a real contribution to the well being of our communities and state. We can hear the results of our SKYWARN, HAMWATCH, and disaster communications. We can see the reaction in the TV and newspaper coverage of these activities. We can ALL be proud that we are amateurs. Our thanks to all the many volunteers in the Field Organization and our Amateur Radio clubs who make this possible. Tlc: W4IRE 207, W4EAT 155, K4IYV 144, K4IWW 110, K4CWZ 91, AB4E 85, AB4EC 74, N4UE 68, KB4FWL 63, WA4SRD 44, K4AIF 43, AB4W 42, K4DDY 41, AF4NC 36, KD4RYE 35, KE4AHC 34, KE4JWJ 29, KE4JWL 28, KE4JWL 26, W4DAC 24, N5XUJ 16, W4DYW 16, W4MRD 14, KE4YMA 13, NT4K 12, N4JTG 11, K4ROK 8, K4ACD 8, K4PAK 7, K4R4J 7, K4KTU 6, K4PAK 5, KE4SMJ 4, KB8VCZ 3, K4PUP 3, N2JLE 3.

SOUTH CAROLINA: SM, Les Shattuck, K4NKK—I have enjoyed visiting the clubs around the upstate. My last visit was to the Spartanburg ARC. I am now a little more polished on my ARRL presentation, and I hoped they enjoyed it. I have a new Affiliated Club Coordinator. Please welcome Jim Brackett, AE4ZJ, from Spartanburg. Jim holds a Doctorate in Education and will be an asset to the leadership team. Local 2 meter net managers please contact me or STM Johnny King, W4UGD. We would like to include your check-in and traffic counts in our monthly report. Also, don't forget the 3.915 South Carolina SSB net at 7 PM. This is an excellent way to pass your report to Johnny. The Union ARC is holding a hamfest on Dec 13, and I'll be on hand to greet members so please stop by and say hello. Tlc: K74SJ 142, W4DRF 79, K4ALRM 65, K4AFP 41, W4UGD 37, K4VIA 23, K4ASLQ 16, K4NKK 14, W4CQB 13, W4AHNA 6, W4ZJI 5, KQ4SY 4, K8DZ 3.

VIRGINIA: SM, Chris Wright, KD4TZN—STM: N4GHI. SEC: K4EC. ASEC: N4SCQ. ASM: AF4CD. ACC: K44YU. SGL: W4UMC. PIC: N0RDC. TC: W3EDR.

VSBN	72	166	225	KD4TZN
VNE	114	243	358	N4GHI
VNL	41	149	201	WD4MIS
VLN	85	178	389	N3PDK

2-meter nets

NVTN	60	375	103	KR4MU
STARES	82	705	1027	KD4JMA

Tlc: K4DOR 386, N4GHI 338, K4MTX 199, KQ4ET 197, KR4MU 174, W4JLS 138, KF4HJW 129, N6ANQ 120, WB4ZNB 104, W4UQ 95, KD4FUN 90, N4ABM 84, AA4GL 78, KF4LBD 71, WB4FLT 67, K4YVX 66, N3PDK 65, KE4YXW 63, AA4AT 49, W4HU 46, KN4US 46, KE4AZL 39, K4DUS 36, KD4TZN 36, KD4JMA 27, K0IBS 27, KE4PAP 26, WD4MIS 25, K4IX 22, KN4OH 20, W4YE 19, W4HDW 19, K4BGZ 18, K4CGB 16, WB4UHC 12, W43AT 11, KB4CAU 10, W4TZC 9, W4MC 9, WB2KQG 8, K4UCE 8, KE4NYY 6, K4JM 5, K5AOG 5, AF4CD 4, KD4GD 2, N4FNT 2, W4IN 2, KE4HFX 2, KE4KET 2, WB4KIT 1.

WEST VIRGINIA: SM, O. N. (Olie Rinehart), WD8V—STM: WD8LDY. SEC: K8QEW. ASEC: K8ZOO. SGL: K8BS. TC: K8LB. OOC: N8OYY. ACC: WD8MKS. Digital: K8MHR. APRS: W8XF. The West Virginia Section and I, as Section Manager, started a new term as of October 1st, and I am very pleased that no operator on the staff requested to be replaced! WD8LDY, Dave Allen, is the newest of the field appointees as our Section Traffic Manager and is digging in with gusto to perform his duties and functions. Looks like Dave will also be a welcome backup for Phil and the section as well as 8RN digital traffic functions. "The Mill," according to the treasurer's report was a financial success (paid all expenses) without dissolving the bank account. Administratively, it did perform well. There is still a nagging troublesome problem of slow growth or, in fact, lack of growth in attendance. Next State Radio Council meeting is to be January 17, 1998. In my travels around the state and on the air, both HF and UHF/VHF, I hear a great deal about ARES/RACES and ongoing and upcoming Simulated Emergency Tests (SET). I am real pleased with the continued and renewed improvement in our performance in these activities to assure that Amateur Radio will continue to provide this very valuable public service function. Please report in some detail and in particular, man hours involved in these SETs. If you discover a new problem unique to your situation and a solution, let us know. Tlc: K8WNO 248, W8JWX 152, WD8V 108, WD8DHC 83, K8QEW 69, W8FZP 35, W8VFN 1109/133/18:19; W8MDN 555/19/08:01; W8VNE 1109/133/18:19; W8VNL 214/54/04:58; ARES/RACES 39 nets 1068/67; Digital 03/43/00:14.

ROCKY MOUNTAIN DIVISION

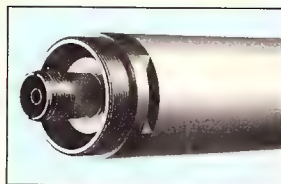
COLORADO: SM, Tim Armagost, WB0TUB—ASM: Jeff Ryan, N0WPA. SEC: Mike Morgan, N5LPZ. STM: Mike Stansberry, K0TER. ACC: Ron Deutsch, N0P0. PIC: Vacant. (Call Tim if you're interested!) OOC: Karen Schultz, KA0CDN & Glenn Schultz, W0IJR. SGL: Mark Baker, K0GPA. TC: Bob Armstrong, AE0B. BM: Stan Morris, N0JQO. By now, all Colorado ARES districts should have held their SET. ECs, don't forget to submit your reports to Mike, N5LPZ, and also to HQ. As we approach 1998, it's also time to prepare and submit Annual Reports. How many newly licensed amateurs (1 year or less) are in your organization? How about youngsters? Let me know your success stories. If you're on the Front Range, check out a new net on the PPFMA 146.97(-) machine—an "Elmer" Net at 19:30L on Mondays. There are always Field Services appointments available: contact the SEC or your local EC if you're interested in Official Emergency Station; contact Mike, K0TER, for Official Relay Station; and Stan, N0JQO, for Official Bulletin Station. Other appointments are also available—contact Tim or me to help; let's keep Colorado the active section it is. 73, de N0WPA. NTS traffic totals: N0UOD 30. Colorado Amateur Weather Net (CAWN)

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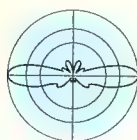
COAX CONNECTION
AT BASE END



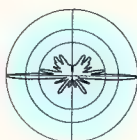
HEAVY DUTY BASE/
RADIAL ASSEMBLY



STRONG JOINT
COUPLINGS



147MHz

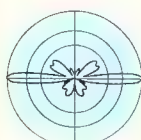


445MHz

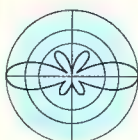
Radiation patterns for
X500HNA/X510MA/X510NA



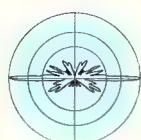
X510



U-300A 440MHz



F-22



U-300A 1200MHz



U5000

GH62

DIAMOND Mono-band Base/Repeater Antennas

MODEL	BAND (MHz)	GAIN (dBd.)	WATTS	CONN.	HT. FT.	RATED WIND MPH (No Ice)
DPGH62 ¹	50		200	UHF	21.0	78
F22A	144		200	UHF	10.5	112
F23A	144		200	UHF	15.0	90
F142A	222		200	UHF	6.0	110
F718A ²	440		250	N	15.0	110
F1230A	1240		100	N	10.5	90

DIAMOND Dual-Band Base/Repeater Antennas

MODEL	BAND (MHz)	GAIN (dBd.)	WATTS	CONN.	HT. FT.	RATED WIND MPH (No Ice)
X50A	144/440		200	UHF	5.6	135
X200A	144/440		200	UHF	8.3	112
X300A	144/440		200	UHF	10.2	112
X510NA ³	144/440		200	N	17.2	90
X510MA	144/440		200	UHF	17.0	90
X500HNA	144/440		200	N	17.8	90+
X700HA	144/440		200	UHF	24.0	90
X2200A	144/222		150	UHF	11.5	112
U200A	440/1240		100	N	5.9	135
U300A	440/1240		100	N	8.3	110

DIAMOND Tri-Band Base/Repeater Antennas

MODEL	BAND (MHz)	GAIN (dBd.)	WATTS	CONN.	HT. FT.	RATED WIND MPH (No Ice)
U5000A	144/440/1240		100	N	5.9	135
V2000A ^{1,4}	50/144/440		150	UHF	8.3	110
X3200A ⁵	144/222/440		100/200	UHF	10.5	112
X6000A	144/440/1240		100/100/60	N	10.5	112

BAND: 144=144-148MHz, 222=222-225MHz, 420=420-430MHz.
430=430-440MHz, 440=440-450MHz, 1240=1240-1300MHz.

Max requirement: 1.4" - 2.4".

¹ 50 MHz antennas are adjustable

² F-718A: 440-450MHz, F-718J: 430-440MHz, F-718L: 420-430MHz.

³ X510NJ: 144-147/430-440MHz.

⁴ 1/4λ, rated in dB.

⁵ 2m: 146-148



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MODEL NO.	HEIGHT MAX.	HEIGHT MIN.	NUMBER SECTIONS	WEIGHT POUNDS	SEC. OD Top.	SEC. OD Bot.	SUGGESTED HAM PRICE
MA-33	33	21' 6"	2	242	3 5/8"	4 1/2"	\$ 899
MA-35	35	22' 1"	3	435	3 5/8"	6"	\$1521
MA-37	37	22' 1"	3	620	3 5/8"	6"	\$2909
MA-39	39	22' 10"	4	645	3 5/8"	8"	\$2509
MA-41	41	22' 10"	4	840	3 5/8"	8"	\$3969
MA-43	43	22' 10"	5	1100	3 5/8"	8"	\$5349

Shown
w/ optional
rotor base
and rotator

FREE STANDING CRANK-UP TOWERS

Will handle 18 sq. ft. antennas at 50 MPH winds

MODEL NO.	HEIGHT MAX.	HEIGHT MIN.	NUMBER SECTIONS	WEIGHT POUNDS	SEC. OD Top.	SEC. OD Bot.	SUGGESTED HAM PRICE
FS-33	33	21' 6"	2	135	1 1/2"	1 3/8"	\$1133
FS-35	35	22' 1"	3	170	1 1/2"	1 3/8"	\$1710
FS-37	37	22' 1"	3	204	1 1/2"	1 3/8"	\$2810
FS-39	39	22' 10"	4	230	1 1/2"	1 3/8"	\$4521
FS-41	41	22' 10"	4	290	1 1/2"	1 3/8"	\$4888
FS-43	43	22' 10"	5	390	1 1/2"	1 3/8"	\$7332

FREE STANDING HEAVY-DUTY CRANK-UP TOWERS

Will handle 30 sq. ft. antennas at 50 MPH winds

MODEL NO.	HEIGHT MAX.	HEIGHT MIN.	NUMBER SECTIONS	WEIGHT POUNDS	SEC. OD Top.	SEC. OD Bot.	SUGGESTED HAM PRICE
HD-33	33	21' 6"	2	600	1 1/2"	1 3/8"	\$1466
HD-35	35	22' 1"	3	870	1 1/2"	1 3/8"	\$2566
HD-37	37	22' 1"	3	1420	1 1/2"	1 3/8"	\$4399
HD-39	39	22' 10"	4	1890	1 1/2"	1 3/8"	\$6721
HD-41	41	22' 10"	4	2110	1 1/2"	1 3/8"	\$8799
HD-43	43	22' 10"	5	3450	1 1/2"	1 3/8"	\$16,999
HD-45	45	22' 10"	6	4400	1 1/2"	1 3/8"	\$18,499

FREE STANDING "LOW PROFILE" COMPACT CRANK-UP TOWERS

Will handle 18 sq. ft. antennas at 50 MPH winds (TMM-433HD handles 24 sq. ft.)

MODEL NO.	HEIGHT MAX.	HEIGHT MIN.	NUMBER SECTIONS	WEIGHT POUNDS	SEC. OD Top.	SEC. OD Bot.	SUGGESTED HAM PRICE
LP-33	33	11' 4"	4	315	10"	18"	\$1210
LP-35	35	11' 4"	4	400	12" x 2"	20" x 8"	\$1466
LP-37	37	11' 4"	5	430	10"	20" x 8"	\$1588

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NEW MEXICO: SM, Joe T. Knight, W5PDY—ASM: K5BIS. ASM: N5OQJ. SEC: K6YEJ. STM: N7IOM. NM: W5JUNO. NM: W5UWY. TC: W8GY. ACC: N5OQJ. New Mexico Roadrunner Net meets daily on 3939@0100 UTC and handled 117 mgs with 1166 checkins. New Mexico Breakfast Club meets daily, 3939 at 6:30 AM and handled 208 mgs with 1068 checkins. Yucca 2-mtr Net 7/8/18 handled 14 mgs with 637 checkins. Caravan Club 2-mtr Net, 6/6/06 handled 13 mgs with 115 checkins. SCAT Net, 6/6/06 handled 15 mgs with 656 checkins. Four Corners Net handled 21 mgs with 520 checkins. GARS Net, no report. QCWA Net with 22 checkins. Rusty's Net with 79 mgs and 683 checkins. Congratulations to all who worked so hard on the Mud Flats Hamfest in Farmington, Don, K6QQT, and all his crew did a wonderful job. Nice to get to see so many hams from Northern NM and Colorado. Tnx to Don, K5BIS, for his help on the trip and making it more pleasant. We are looking forward to the International Hamfest in El Paso, TX on Oct 18 & 19 and the Socorro Hamfest on November 15. Hope to see many of you at these events. So very sorry to report the passing of KC5CEF and W5WOM. We will certainly miss them. We all wish a speedy recovery for W1LCP and K5KKO. So good to see K5GX & K5MEL making such a good recovery. We extend our sympathy to K5FW on the passing of his son-in-law. Vy Best 73, W5PDY.

UTAH: SM, Jim Rudnicki, N2Z7T—Greetings. First of all, I would like to wish all of you my sincere wishes for the holiday season. May all your travels be safe this winter. Many thanks to all of you in the field organization. Your work on the behalf of ham radio does not go unnoticed. I am still working on meeting all of you! I would also like to extend a special thanks to ASMs Bill Moyes, N7IE & Alan Brubaker, K07X. SEC: Mike Collett, K7DOU. STM: Jim Brown, NA7G. SGL: Verne Borgeson, K8Y7SK; NM & BM: Dallas Barrett, W7MEL. PIO: Lon Stuart, W7ME; & our new TC Jim Lawrence, W7CT. This past September brought a rare opportunity. Suri, VU2MYA, the executive vice director of the India Natl Institute of Amateur Radio stopped by for a visit. He is quite a smart and dynamic gentleman. Brent Thomas, AC7H, Chuck Chambers, W7LFI, and I gave Suri the grand tour of the State Office of Comprehensive Emergency Management. India is slowly expanding their role in Amateur Radio to include emergency services, and they wanted to learn from us. A great visit! Don't forget the HF RACES net on Sat. 11/15 at 0800 on 3918. I'll have the new loop up and operating. I have been also trying to check in on the Beehive Net (daily at 12:30L on 7.272 MHz) with pretty good results. Nice to have good antennas for a change, H! As we head for the end for the new year, many clubs will be changing officers. Please drop me a line and let me know who is leading your club in 1998. Traffic: W7MEL: 34, 73 de N2Z7T.

WYOMING: SM, Bob Williams, N7LKH—There have been several e-mail queries as to the names and addresses of the section staff so we will list them all again here: Jerry Pyle, WB7S <jpyie@trib.com> 307/568-2368. STM Flint Downing, KJ7IM <bdowning@uwyo.edu> 307/721-3022. SEC: Steve Cochran, WA7H <wa7h@aol.com> 307/635-7085. PIC: Gene Epperle, W7JL <w7jl@wave.park.wy.us> 307/527-6376. ACC: Mary Williams, K7MCK <k7mc@wave.park.wy.us> 307/527-7758. TC: Art Edmonds, K7BZ <aedmonds@trib.com> 307/568-2601. Congratulations from the WY Section to the University Amateur Radio Club of Laramie on the 10th anniversary of their "Code of the West" newsletter. Also, congratulations to Barry Mather, K8VQV, UARC President, on winning the Dayton Amateur Radio Association scholarship of \$2000. Very well done Barry! Work continues on assembling the configuration data base for the HERC and Packet systems in the Wyoming Section. TS Robert Elder, K7EMS, is expecting to publish the configuration for Northwest Wyoming this month, and Ike Christopherson, WA7NZI, will publish the configuration of the Cedar Mountain Amateur Radio Club repeater network at the next CMARC monthly meeting.

SOUTHEASTERN DIVISION

ALABAMA: SM, Tom Moore, KL7Q—ASMs: WX4I KC4RNF KR4TZ KL7P KX4I KT4JW KA4PKB KB4KOY. SEC: KC4RNF. STM: WB4GM. PIC: KE4CAP. BM: KA4ZXL. SGL: KE4RPX. TC: N4TKT. ACC: AD4DB. Congratulations to the Montgomery ARC for putting on a great hamfest and ARRL State Convention last month. There were really lots of great prizes awarded. Our special thanks to Rick Palm for coming all the way from HQ ARRL and, of course, to Frank Butler SE Division Director for attending. We had lots of good eye-ball QSOs and some very interesting meetings and forums. My thanks and appreciation are extended to the ARRL Alabama Cabinet and all the ARRL Alabama Field appointees for working so hard to make amateur radio better for all HAMS in Alabama. I could not leave this position without expressing a very special thanks to very good friends Ricky Kimbrell, KC4RNF, and Jim Smiley, KE4CAP, David Black, KB4KCH, Rex Free, KN4CI, and Ryan Bridges, KD4AMK, for their commitment, hard work, and wisdom in bringing together Alabama, geographically, in coordinated support of the SKYWARN program. So many have done so much. I'm really very humbled to have had the opportunity to be a part of it all. To each of you, Mary and I extend our warmest of holiday greetings in wishing you a very Merry Christmas and a happy, prosperous and healthy New Year. 73, Tom KL7Q.

GEORGIA: SM, Sandy Donahue, W4RU—ASM/Legal: Jim Altman, N4UCK. SEC: Tom Rogers, KR4OL. STM: Dick Baxter, K5TF. SGL: Charles Griffin, WB4UVW. TC: Eddie Kosobucki, K4JNL. ACC: Jud Whitley, W4NZJ. OOC/RFI Ed Tanton, N4XY. The Colquitt County ARC operated special-events station, WD4KOW, at the Subelt Expo in Moultrie for the 20th year. HamLunch, an informal lunch group, meets every Thursday noon at the Red Lobster, Pleasant Hill Rd, Duluth, across from Gwinnett Place Mall. We have a new GA Section Website <http://www.gatech.edu/Radio/ga>. Thanks to GA Tech ARC & Pres N2NSZ for the site. We now have 2 Websites in GA and 1 for the SE Div. Several large clubs in the state also have webpages—all the better to get out information to their members. Club

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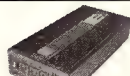
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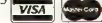
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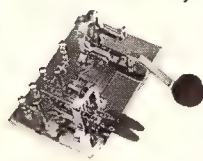
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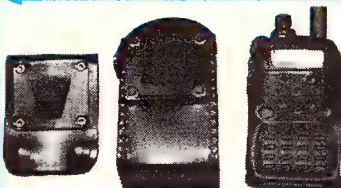
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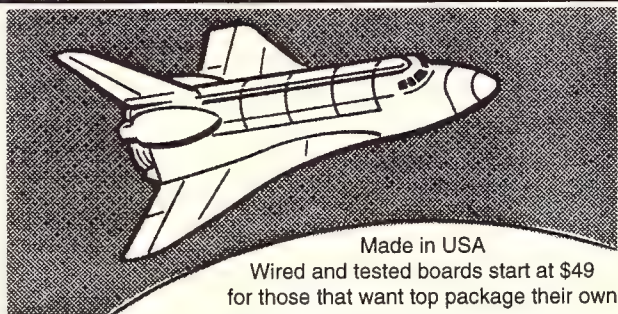
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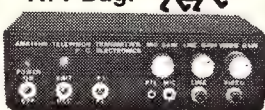
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presidents—please put me on your mailing list or better yet e-mail list. Address on page 12. Alford Memorial ARC re-elected its entire officer corp: pres KD4HPD, vp W4EPI, sec KS4JR, treas KA4IAO, trustee N24A. It's the Christmas season this month. May you all have a merry and safe one. Tlc: K5TF 292, K1FP 188, AD4KA 109, KA4HHE 83, WB4GGS 74, WU4C 6.

NORTHERN FLORIDA: SM, Rudy Hubbard, WA4PUP—ASM: N4ADI. ASM-Youth: KO4TT. ASM-APRS: WY8O. ACC: W4UE. BM: N4GMU. OOC: WB4GHU. PIC: KF4FHC. SEC: WA4NDA. SGL: KC4N. STM: WX4H. TC: KO4TT. Packet: N4GMU. The SET appears to have been successful. The Northern Florida Section did not conduct a section-wide SET, but left the DEC's and EC's to conduct a test in their area. However, the section did pass traffic to the SEOC, thru the W4MLE station using the SITREP procedure. The APRS system was used with digipeaters, from some of the districts to the Capital District. This was the first time to test this procedure. I have noticed some of the club newsletters have started including their e-mail address with some including the members e-mail address. The clubs are invited to send their address to both the ACC, and PIC. These individuals are anxious to assist you in any way they can, and the use of e-mail can be of great help. News concerning tower restrictions are much better. Polk County, Pasco, Osceola, Clay, and Orange Park have been successful in getting the counties to exempt the amateur tower and antennas from their planning and ordinance laws. W4UE, our ACC, will send anyone the Clay County version to use as a guide to assist you in the event your county is trying to pass restrictions. FYARC (Florida Youth Amateur Radio Clubs) has a newsletter HAMLET. Bruce Reid, WB9SHT, and Philis West, KA4FZL, are busy working with the youths in Florida. They also represent both sections, and the clubs are encouraged to contact them so they may assist you in forming clubs in the schools. The ARRL National Convention has been reported as highly successful in Jacksonville. The group in Jax certainly put forth a lot of hard work. I'm sure all join me in congratulations and thanks for a job well done. ARRL has requested FCC to authorize a new enforcement procedure for rules violations (RM-0150). It would allow ARRL to take complaints of serious rules violations directly to the FCC's Administrative Law Judges and to bypass tedious administrative process through the FCC's Wireless Telecommunications Bureau. Wishing each of you the best Holiday Season. 73, Rudy, WA4PUP. Tlc: KE4DNO 451, WA4NDA 259, NR2F 222, WA4PUP 148, KE4OAV 138, AD4DO 132, AD4BL 131, KN4NFP 115, W5MEN 112, KD4SIV 66, KD4TOK 64, KS4FB 58, KS4DW 57, AB4PG 49, KE4SCU 38, N0ZO 36, KB4DCR 33, W4KIX 29, N4JAQ 29, KC4FL 21, WA4EYU 16, KF4ZTP 15, WB2IMO 15, KE4LTS 13, AD4QH 9, KM4WC 9, KJ4HS 8, KF4QJZ 8, W8IM 7, KF4TQX 4, WX4J 3, KE4BMI 2, KF4GUA 1.

SOUTHERN FLORIDA: SM, Robert "Rip" Van Winkle, AA4HT 941-853-1400—ASM: KA4FZL, 941-574-3467. ASM for Youth Activities: WB9SHT 407-336-5608. STM: WY5Z, 407-496-5257. SEC: W4SS 561-967-1477. Asst SECs: WB2WPA 941-775-2397, KD4GR, 954-748-0775. TC: K1AT, 954-791-4275. BM: WA4EIC, 941-543-4853. PIC: WA4ATF, 813-733-9441. OOC: WB4GHU, 941-647-1415. ACC: W3BLW, 813-541-2895. SGL: KC4N, 904-385-5924. Pkt Mgr: KB4VOL, 407-546-2532. It was great to see so many folks at the Melbourne Hamfest. While the forums were not as well attended as last year, there was excellent participation and feedback from those folks that did attend. Some of the lack of attendance may be due to the scheduling of this year's forums before lunch while the last couple of years the forums have usually been scheduled after lunch. Frank Butler, W4RH, Director SE Division and Evelyn Gauzens, Vice Director SE Division, conducted a very interesting and active ARRL Forum. A wide range of subjects were covered and some generated considerable discussion from those in attendance. One of the subjects covered was the idea of pursuing with the state legislature the idea of a special license plate for Amateur Radio operator's vehicles. The plate would probably have Amateur Radio printed on it plus maybe a picture of an antenna or something similar. Some of those expressed considerable interest in the plate as long as there was no additional cost, while others at the meeting felt that the license plate would be a flag to thieves that there was ham radio equipment in the vehicle. Those that favored the license plate pointed out that antennas for radios, cellular phones, etc are already a flag, so a plate would not make any difference. If you have thoughts on this, please pass them on to either Frank Butler, Evelyn, or me. My address is on page twelve. Don't forget the Tampa Hamfest/ARRL Southern Florida Section Convention that will be held on November 21-22 at the Tampa Fairgrounds. There will be ARRL, NTS/ARES and other forums held so hope to see many of you there. Bruce Reid, WB9SHT, ASM for Youth Activities, has published another issue of *Hamlet*—the official newsletter of FYARC and did a super job explaining how a FYARC (Florida Youth ARC) chapter can be formed. Bruce is coordinating youth activities for both sections in the state with an Advisory Council made up of members from both sections. The newsletter is sent to ARRL Affiliated Clubs, school clubs and other interested parties. He reports that four chapters of FYARC have already been formed. Neil Lauritsen, KA3DBK, EC Pinellas County, reported that Hillsborough County ARES members provided communication support to the Red Cross and Hillsborough County officials for a week after the extremely heavy rains of September 25th through 27. The rains flooded many areas of the county forcing the residents to be evacuated. After a week of providing that support, Pinellas County ARES members went to Hillsborough County to help and to relieve some of the Hillsborough hams that had been working all week. Great cooperation. Don't forget the ARRL Information Net every Saturday morning at 7:30 AM on 3940 kHz. 73 de AA4HT. Tlc: WA9VND 700, W3VR 685, W3CUL 588, KA2YZM 508, K4SCL 458, AB4XK 317, KA4FZL 253, KB4WBY 236, KC4ZHF 230, W7AMM 209, WB4PAM 155, KD4HGU 152, KD4GR 139, AA4HT 138, W4DL 133, KD4OGU 108, WA4EIC 104, KD4JMV 95, W4DWN 57, K2GNZ 51, WD4JNM 43, AA4BN 40, KT4XK 31, WB4GCK 26, KB4MON 25, KE4WBI 20, K4RBR 17, W4WYR 17, KE4UOF 11, K4OVC 10, W3JR 9, K3KT 4, KD4QDD 2, WB4TOV 2.



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VIRGIN ISLANDS: SM, John Ellis, NP2B, St Croix—ASM: Drew, NP2E, St Thomas—ASM: Mal, NP2L, St John. SEC: Vic, WP2P. PIC: Lou, KV4JC. ACC: Debbie, NP2DJ. NM: Bob, VP2VI/W0DX. St John ARC is now meeting on the first Saturday of each month, at 9:00 AM, no regular site yet, but contact someone on the local repeater for info. St John repeater has now moved from 146.97 to 146.63 to get away from other repeater QRM. St Thomas ARC is now meeting at "Hook, Line & Sinker" in Frenchtown, not far from old Seaplane base. Time is noon, every Tuesday. For further info, contact someone on 146.81 repeater. NP2E and KP2N worked the RTTY contest, looks like they made over a million points. Good work folks! Looks like the island-wide St Croix ARC ham radio and local club awareness party will be scheduled for November since a suitable site was not available in October. There will be a silent auction of the ham gear owned by Clyde Singleton (SK), KP2M, whose family graciously donated the equipment to the club. No storms this year, antennas going back up for the contests! 73, John, NP2B.

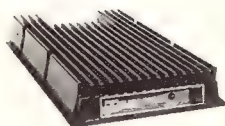
SOUTHWESTERN DIVISION

ARIZONA: SM, Clifford E. Hauser, KD6XH—This year is almost gone, and I have not completed what I started out the accomplish, visiting all the clubs in Northern Arizona. My present plan is to be in Yuma on December 3rd for their meeting and also at the fall hamfest in Mesa on December 6, 1997. By the way, are you planning to attend the Superstation hamfest at Mesa Community College on December 6, 1997? This event will be larger than last year with many people selling and a lot of people buying. The Quarter Century Wireless Association (QCWA) dinner will be held at the Scottsdale Safari hotel at 1200 hours on Saturday December 6, 1997. The Eastern Valley Amateur Radio Group (EVARG) will commemorate the battleship, USS Arizona, lost at Pearl Harbor on December 7, 1941, with a special event station. Frequencies to be used are 14.240 MHz, 21.340 MHz, and local 2-meters. QSL via EVARG, 3264 E. Carol Ave., Mesa, AZ, 85204-3245. The Arizona Science Center ham station is over 6 months old. Have you visited the center to see what the local Amateur Radio population has accomplished? If not, do it soon, you can even operate their station. The Arizona traffic system is alive and well with Robert Howe, W7EP, as the state traffic manager. Each night at 0700 hours on 3992 MHz is the Arizona traffic net. Check in and help our state maintain a good traffic flow. Oliver Grieve, W7WGW, has an excellent 2-meter repeater, 146.860 (-), located in Benson that gives good coverage for southern Arizona. Also there is an EAAR net every Sunday evening at 1900 hours on 146.900 (-). This repeater is located on Heliograph Peak. The three (3) DX clubs are very active and doing well. Did you read your October QST about the FCC change to the Amateur Radio station RF exposure evaluation? They did a sliding scale on power output that most likely means that your station will be exempt from testing (if not using linear) for all frequencies except 10 meters. Len Winkler, KB7LPW, "Ham Radio and More" is alive and well. Ned Stearns (Mr. Professor), AA7A, is the co-host. For the Phoenix area, the time is 1400 hrs local (2200 Z) on Sunday on KFNH, 1500 AM, and on 12.160 MHz (short wave). 73, Clifford E. Hauser KD6XH. Net: ATEN 638 QNL, 66 QTC, 30 sess. Tlc: K7VVC 669, AB7NK167, WB6OTS 98, W7EP 97, KJ7KL 36.

LOS ANGELES: SM, Phineas J. Icenbice, Jr., W6BF—Every word that you use is an indication of your wisdom or ignorance. Your greatest gift is your thinking mind. Don't set up rules of conduct for others until you have a workable system for yourself. Pull gets you an introduction, but to continue you must do most of the pulling yourself. Oh, well, there must be a million good "quotes" like these, but these are a few of the selected "quotes" from *Think and Grow Rich*. We had a great ARRL Convention at Riverside this year. Parking was free, and everything was clean and neat. This always puts the convention attendee in a great mood. Congratulations to AD0A, Jerry, and all of the great gang who contributed their time and talent. It was really great. Our own, "Mr Lightning himself," Bill Wysock, N6UXW, put on his unusual and outstanding "very high voltage demonstrations" with one of his many Tesla Coils. Don't miss the next "Big ARRL Convention" in this division. In 1998, it will be in San Diego. The PANDA Convention—yes, it is also called Pandemonium! Several hundred preregistrants already have their PANDA pins. Traffic totals: Hank, W6SX, 29 (on vacation), and Jerry, AD0A, 88. Attention ARES operators: Every Sunday (160 meters) at 11 AM on 1945 kHz, you can join in the fun and practice for emergency work. When the real emergency arrives this may be one of the best bands for local traffic. When you operate this top band for local contacts remember the low, near-horizontal antenna is often 10 to 20 dB better for short-range contacts. - 3.3 million FCC records are available on CDROMS (all FCC licenses & frequencies) for about \$38, from Per Con Corp. (716-386-6015) Limited free information is also available on the internet. (<http://www.perconcorp.com>). I was able to pull up 13 pages of LA County frequencies, call signs and other valuable information. ARES information is available from our SEC, Hank Magid, K6YMJ, (hmagid@aol.com) or his assistant SEC, Dennis, KA6GSE, (dsmith@smartdocs.com) Noisy volume controls and erratic mice (computer mouse) are easily fixed with the famous WD-40, it doesn't take much. In most cases, but, not all, repair is possible by spraying the WD-40 into the erratic area without removing any covers or knobs. My experience has been 100% so far (10 out of 10). Good Luck and God Bless! 73 de W6BF, Phineas.

ORANGE: SM, Joe H. Brown, W6UBQ—From our SM, Joe Brown, W6UBQ: "What Jerry, AD0A, Jeff, KD6NXX, and all the SW Div Convention Committee chairs promised, they delivered. Congratulations." Joe also advises that Art Suturos, K6GHF, is taking over from John Wendt, W6BFI, as the new Orange Section Technical Coordinator, and that Joe Magaditsch, KO6XB, is taking over as Riverside County Asst Sec Mgr from long-time volunteer, Bob Mann, W6LKN, who recently retired due to illness in the family. Congrats, Art and Joe, and may you both serve for many years with pride and distinction! In an e-mail to SW Dir Fried Heyn, W6WZO, Bill Pasternak, WA6ITF, of "Newline" made an extraordinary statement regarding last Sept's SW Div Convention. "Riverside was probably the BEST convention ever in the SW Division. Please pass along my congratulations

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DXP-U150	70 cm	30W/150W	\$429.00

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DXR-V175	2 meter	50W/175W	\$629.00
DXR-V220	220 MHz	20W/150W	\$659.00
DXR-U150	70 cm	70W/150W	\$789.00

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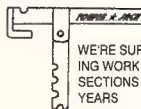
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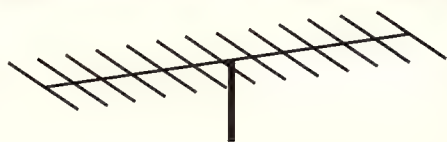
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D-68	10/15/20/40/80/160	8	146'	162.95

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VS-42	10/15/20/40	2	24'	64.95
VS-53	10/15/20/40/80	3	42'	79.95
VS-64	10/15/20/40/80/160	4	73'	98.95

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D-20	20	33'	19.95	24.95
D-40	40	66'	24.95	28.95
D-80	80/75	130"	29.95	33.95
D-160	160	260'	41.95	45.95

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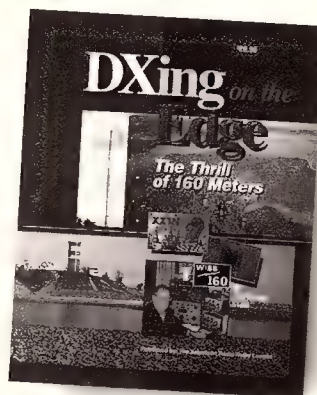
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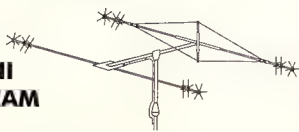
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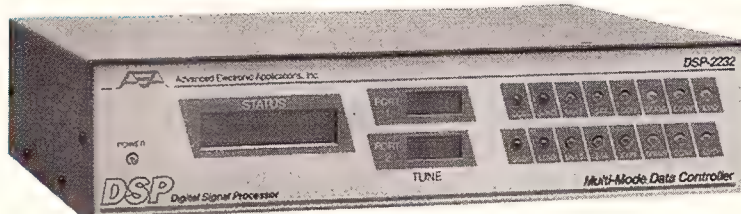


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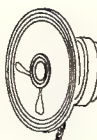


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to those who made it happen." Thanks a million, Bill, from all those who worked so hard to make it a go. Fred Roberts, W6TKV, wrote a great blurb about the special-event station at the HAMCON '97, and we'd love to publish the whole thing in this column; however, it isn't possible. Highlights include: "...This was the very first time WIAW has been authorized for use at any division-level convention. In addition to the special-event team consisting of members of the Corona Norco ARC, the Riverside County ARA, and the Golden Triangle ARC, there were many guest operators who were attending the convention. A total of 47 hams operated WIAW/6 contacting 47 states and 6 countries with a total of 779 QSOs. Everyone associated with this station had a great time." The IECARO trophy for most points garnered on Field Day was awarded to the Citrus Belt ARC (C-Bar-C), Fullerton RC's pres, John, KD6PGC, comments on the radio frequency auctions approved by Congress: "...the rush to grab radio spectrum makes the Oklahoma land rush of 1899 look like a slow walk. In any event, you can bet that our current band allocations are not all that secure. Chief RACES Officer for the City of Huntington Beach, Ron Jagodinski, KD6EMN, reminds amateurs here in SoCal: "Let's all be prepared for El Nino this year." The coastal cities will surely be hit with storms from the south, with resultant high surf and flooding. Some estimates project the Inland Empire may see 40 or more inches of rainfall this year. STN N6GIW reports for September 1997: NTS t/c: K06RZ 305, N6GIW 217, KC6SKK 125, KD6EYI 64, W6OZ 58, K46TND 17, N3IVO 13, W6QZ NTS BBS 270, SCN/V 30 sess; QN1 342; QTC 138, PSRR: W6QZ 127, K06RZ 127, KC6SKK 102, N6GIW 93. Glenn also writes: "CW traffic handlers please try SCN/I on 3598 KHz at 7:15 PM weekdays." Vy 73, KE6JOF.

SAN DIEGO: SM, Patrick Bunsold, WA6MHZ, 619-561-0052—SEC: Pat Ryan, KC6VVT, ASM/MARS: Harry Hodges, WA6YOO, ASM/ACC/PIC: Tuck Miller, KC6ZEC, ASM for Youth: Frank Forrester, K16YG, ASM for Red Cross: Al Rich, W6WYN, Bul Mgr: Steve Adams, K6PD, STM: Warren Dilley, KT6A, SGL: Bob Spann, K6BLL, OOC/TC: Del Radant, N6UZE, DECS: North: Dennis, K7DCG, South: Pat, K46PSG, East: Rich N6NKK, Central: Dave, KC6YSO. Hurricane Nora, while not a deadly one, still did lash the section, especially Imperial County and area hams were on the scene helping out. ARES & RACES were busy. A tragic wildfire was ravaging Escondido at the same time, which the rain eventually put out but not before several homes were lost. Palomar ARC had a giant auction where the most exciting item was a new-in-the-box WW2 ARC-5 xmt (which I was outbid on). Big turnout at the PARC picnic at Dixon Lake. ARC of El Cajon had Gordon West, WB6NOA's, spectacular program. SOBARS guested Charles, W6SF, on the Wonderful World of DX. Fried and Sandi, WA6WZO/WA6WZN, came to the El Cajon Elks ARC. Tremendous turnout for the Sandra Pizza Party at Fillipi. Remember the gigantic HAM/COMPUTER SWAPMEET 1st/3rd Sats at Santee Drive-in. ARES Sunday Nets: 3905 @ 9 AM, 146.265 @ 7 PM. Traffic: SDCTN: Sess 29, QN1 377, QTC 188, ARESN: Sess 4, QN1 15, QTC 2, T/c: KT6A 509, KD6YJB 309, K06BU 46, KE6IQQ 46, WA6IJK 2, PSRR: KT6A 134, KD6YJB 101, SDCTy Traffic Net 8 pm every night on 146.730 (-) Internet e-mail: wa6mhaz@juno.com. Packet ADR: WA6MHZ @ WB6DGR, #SOCA.CA.USA.NA. PBBS: WA6MHZ-10 (via UVUNOD) on 145.630. APRS: 145.790

SANTA BARBARA: SM & STM, Rob Griffin, K6YR, 805-543-3346 & k6yrr@arll.org—SEC: Jennifer Roe, AA6MX, ACC: Chuck McDonald, K4CAN, BM: Howard Coleman, W6HOA, OOC: Tom Perkins, KD6BXM, PIC: Jeff Reinhardt, AA6JR, TC: Warren Glenn, KM6RZ, ASMs: Doc Gmelin, W6ZJR & Don Milbury, W6YN, DECS: SB-Rick Laird, KB5OO, SLO-Jack Hunter, KD6HHG, & Ven-Dave Gilmore, AA6VH. The '97 SLO Co Siren Test a success thanks to area hams and Bob, WA7NMJ. Several SB section hams were spotted at the very successful '97 SW Div Convention in Riverside. Make plans to sign up for the '98 Convention in San Diego. Contact me for more info. FEMA is offering preparedness info on the coming El Nino: call 800-323-5248. The San Luis Obispo Co Emergency Communications Council has published an excellent brochure explaining SLOECC services and resources, thanks to Bob, W6TTX, the SLOECC newsletter editor. The ARRL Board of Directors has authorized filing of a petition to the FCC to include band-planning in Part 97, the Federal Regulations for the Amateur Radio Service. Please contact your Div Dir, Fried, WA6WZO, on this important issue. Volunteer band-planning needs to have some teeth, and this approach may be the way to do it. The VCARC has set December 12, at 5 PM for the DecemberFest Annual Dinner in Ventura. Contact Ralph, KE6KX, at 482-5919, for details. Martin Reid, N6QU, is offering a series of fine, short articles on CW ideal for newsletters. Club editors contact me for details on obtaining this series free. T/c/PSRR: K6YR 311/193, KE6MIW 21/103, W6ZJR 44/-, KM6RZ 8/-, WA6DQK 2/93, & KE6GFV 4/96.

WEST GULF DIVISION

NORTH TEXAS: SM, Bob Adler, N5NY—Pkt N5NY @N5NY.#DFW.TX, e-mail: n5ny@arll.org. ASMs: KA5TTO, W5GPO, W5IWE, KG5SC, WD5IVD, KB5LES, WB7NPH, W5PFI, N5UQA, KB5YAM, N5WOY, KJ5AE, K5RE, K5LP, K5SXX, K5ZSB, K5SNA, K5SQA, KJ5GE, KC5EIR, K5UG, KC5AYL, KB5JBV, W5FB, KX5K, ACC: K4TTT, STM: KC5OZT, SEC: K5UPN, PIC: WW5L, SGL: N5GAR, TC: KJ5BA, OOC: WB5UDA, BM: W05H. Greetings All! First things first, my apologies to Gary Hall, KB5LWZ, the Emergency Coordinator for Hunt County. I did the "unthinkable" in my column last month and misquoted Gary's call sign, please forgive me for the oversight, Gary. And in Hunt County, we have several dedicated hams that are currently working under Gary's direction and with the Greenville City Council on a zoning ordinance that could potentially prohibit the addition of towers in Greenville. By the time this article is published, will have either failed or succeeded, but the actions of those who have dedicated their time and efforts in this mission will certainly be appreciated. John McFadden, N5TIP, recently was elected as president of the Rockwell Amateur Radio Club. I think that John was up for a couple of years and did such a fine job in that capacity, that he was asked to serve as president. I am certain that you will do a fine job John; congratulations. In

North Texas, we are currently looking for hams who are members of the ARRL and that may have an interest in one of the following field appointments: Official Relay Station-Official Relay Stations send, receive, originate and deliver formal messages on behalf of the public, and report their activity to their Section Manager and Section Traffic Manager. Official Emergency Station. The Official Emergency Station is ready, willing and able to answer the call when normal communications are down. Are you? If so, talk OES with your Section Emergency Coordinator. Official Bulletin Station: The "town crier" of Amateur Radio, the OBS transmits official and local bulletins of interest to radio amateurs via local and section nets, on the air bulletin board systems, and other information outlets. Getting the word to the troops is one of the most crucial jobs in today's Field Organization. Public Information Officer: Have you got an "in" with the local news media? Or, do you have a shack that is photogenic, lending itself well to TV crews doing live interviews when Amateur Radio makes the 6 o'clock news. The active PIO makes sure Amateur Radio is seen in a positive light by the public. Technical Specialist: "How do I feed my dipole?" "What size feed-line should I use?" The TS is the point man for questions like these from Novices and old-timers alike. The TS also steps in to assist with local RFI problems. The above is just a partial listing of the field appointments and the qualifications for all of the above is full ARRL membership, Novice or higher license. In addition to the requirements, the Official Emergency Station appointment requires that you have emergency power. These are just a couple of the rewarding appointments that you may apply for and we encourage you to consider doing so. The reward is a sense of satisfaction that is unequalled. Due to a lack of "news-worthy" information, that's about it for this month. If you or your club has anything that you would like mentioned, send it to me at the Callbook address or ka5tto1@swbell.net. Until next month, 73 and may God Bless, Bob, KA5TTO.

OKLAHOMA: SM, Coy Day, N5OK—ASMs: N6CL, K5CPZ, KB5ZUD, SEC: W5ZTN, STM: AB5RV, ACC: KB5BOB, PIC: WA9AFM, OOC: K5WG, SGL: W5NZS. (http://www.telepath.com/n5ok/) The Great Plains Amateur Radio Club sponsored a great Swapfest in Shattuck. The wind mills in the center of town are a must see! Dave, KD5FX, invited me to Ponca City to be the speaker for the first fall meeting of the Kay County Amateur Radio Club. I found a good number of excited radio amateurs with a fairly even spread from new hams to old-timers. They are very active with a couple of repeaters, VE sessions, a weekly net, a bimonthly newsletter, storm spotters, etc. We wish Nate, KA0RNY, well with his new QTH in Kansas. He has his antennas back up so watch for him. John, KC5VEI, reports the Univ of Oklahoma ARC participated in the Sept VHF QSO Party, running 4 bands from the top of Sarkey's Energy Center in Norman, about 150 ft up. Highlights were a 70 cm FM contact into Ft Worth, and 2 M and 6 M contacts into South Dakota. Tulsa Amateur Radio Club supported the MS150 this year with a portable 2 meter repeater on 147.045. They furnished mobile comm for emergency and medical vehicles. The operation was from a command trailer they had converted from a Salvation Army canteen trailer. John, KB5RV, reports that he, Pete, KF5RD, Don AC5II, Jeff, KC5RTH, Harlan, K9GDK, and William, KC5SFB, helped Don, W5UUX, demo Amateur Radio to about 4,000 Boy Scouts at Camp Russell. They made many contacts with two HF rigs and used hand-helds for local work. T/c: N5IKN 602, WB5NKC 407, K5GBN 221, KE5JE 174, WA5OUV 83, WB5NKK 72, AB5J 48, AB5RV 46, K15V 36, W5REC 31, K15LQ 27, KC5PDX 18.

SOUTH TEXAS: SM, Ray Taylor, N5NAV—As the new Section Manager for South Texas, I would like to take this opportunity to thank Alan Cross, WA5UZZ, for his contribution to the ARRL and the South Texas Section. If I can be of any assistance to you in your future Amateur Radio endeavors, please let me know. I want to thank all of you who had confidence enough in me to be the South Texas Section Manager. I hope I can meet your expectations. The Section Manager can't do much without the support from the field. I will be looking forward to working with you. Double thanks to Ed Larose (K5SV) and Don Jones (N5WSW). Just a brief introduction. As some of you know, my greatest interest is in traffic handling and emergency communications. I am very technically oriented, and still enjoy the building and repair of equipment and antennas. I conduct training on 2 meters and HF on traffic handling, NTS system, NCS and EC responsibilities, reports, and emergency communications procedures. There are so many areas in ham radio in which people may participate. By the time you read this, most of you will have completed this year's SET exercise. I hope this was a real learning experience for each group, and you spotted your areas for improvement. I hope in the coming years to see more SAR and PSRR reports coming in from the section. We might have to have two pages in QST to handle it all. If there is any way I can assist anyone please let me know. If there is anything you would like in the section news, let me know. The best of hamming and 73 to all. T/c: K5KOT 336, N5NAV 326, W5KLV 225, K5SV 187, W5YQ 121, KB5UCQ 124, W5TFB 86, WB5YD 85, W5RZV 75, W5CTZ 68, KD5GM 59, WD5GKH 50, WA5FQX 36, N5LF 32, KB5RU 24, N5OUJ 22, N5BMB 15, KG5CX 4, N5JUJ 3.

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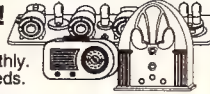
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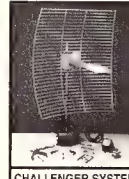
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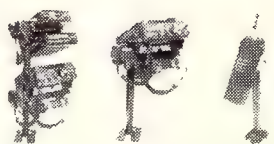
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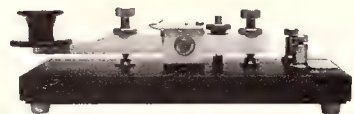
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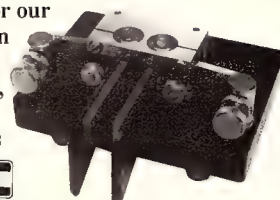


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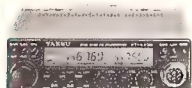


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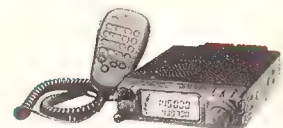


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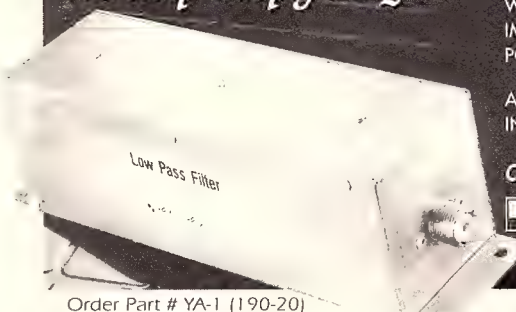
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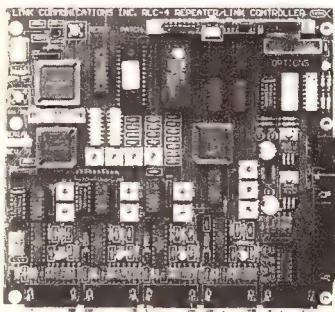
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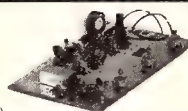
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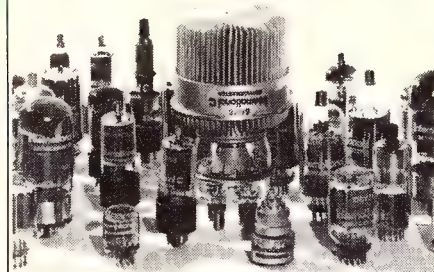
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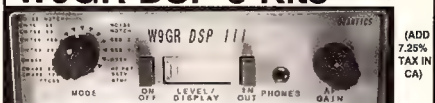
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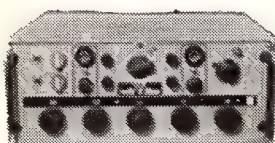
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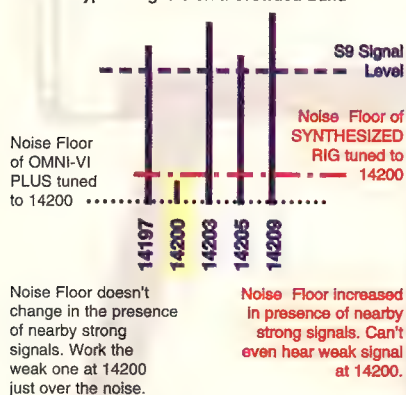
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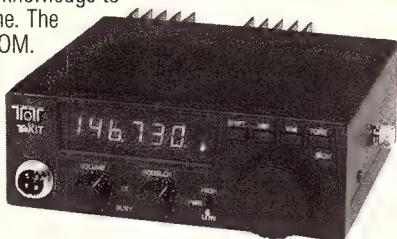
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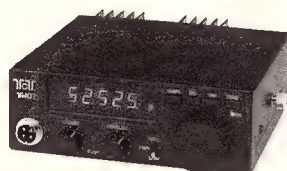
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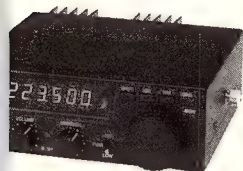
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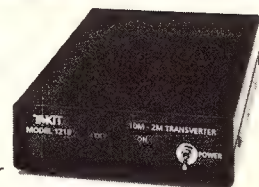
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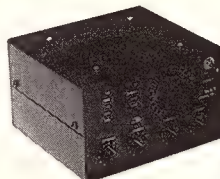
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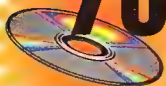
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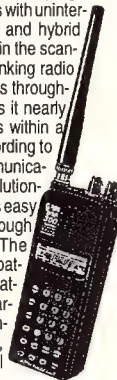
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6) No Ham-Ad may use more than 100 words. No advertiser may use more than two ads in one issue. A last name or call must appear in each ad. Mention of lotteries, prize drawings, games of chance, etc. is not permitted in QST advertising.

7) New firms or individuals offering products or services for sale must check with us to determine if a production sample (which will be returned) should be submitted for examination. Dealers are exempted, unless the product is unknown to us. Check with us if you are in doubt. You must stand by and support all claims and specifications mentioned in your advertising.

The publisher of QST will vouch for the integrity of advertisers who are obviously commercial in character, and for the grade or character of their products and services. Individual advertisers are not subject to scrutiny.

The American Radio Relay League does not discriminate in its advertising on the basis of race, color, religion, age, sex, sexual orientation, marital status, or national origin.

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JOIN the Lambda Amateur Radio Club (LARC) since 1975, the only open and visible public service-oriented ham club for gay and lesbian hams. Monthly newsletter, HF skeds, internet listserv and IRC, hamfest meetings, chapters, DXpeditions. Write LARC, POB 56069, Philadelphia, PA 19130-6069 or e-mail: LARC@netquest.com

JOIN THE RAINBOW AMATEUR RADIO ASSOCIATION, the gay/lesbian ham club with active HF nets. E-mail: RARA@EN.COM or mail to PO Box 191, Chesterland, OH 44026-0191.

MARCO: Medical Amateur Radio Council, operates daily and Sunday nets. Medically-oriented amateurs (physicians, dentists, veterinarians, nurses, therapists, etc.) invited to join. For information write: MARCO, Box 73, Acme, PA 15610.

QCWA—Quarter Century Wireless Association. If you were first licensed 25 years ago and currently licensed you are eligible. Be one of us! Write Dept. T, 159 E 16th Ave, Eugene, OR 97401-4017. Call 541-683-0987.

THE ARRL LETTER—The League's news digest for active amateurs, professionally produced and edited and now available in weekly electronic edition via the World Wide Web at <http://www.arrl.org/arrlletter>

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CLASSIC RADIO REPAIR 1920s-1980. Any make or model. Keith Zarin, KA4RGQ, 10841 Split Rail Drive, Manassas, VA 20112. 703-330-8457.

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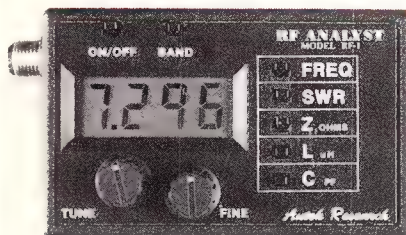
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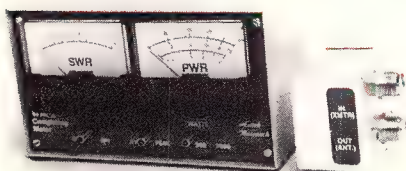
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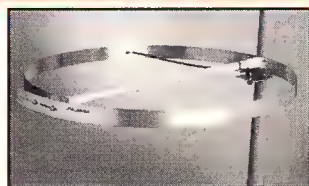
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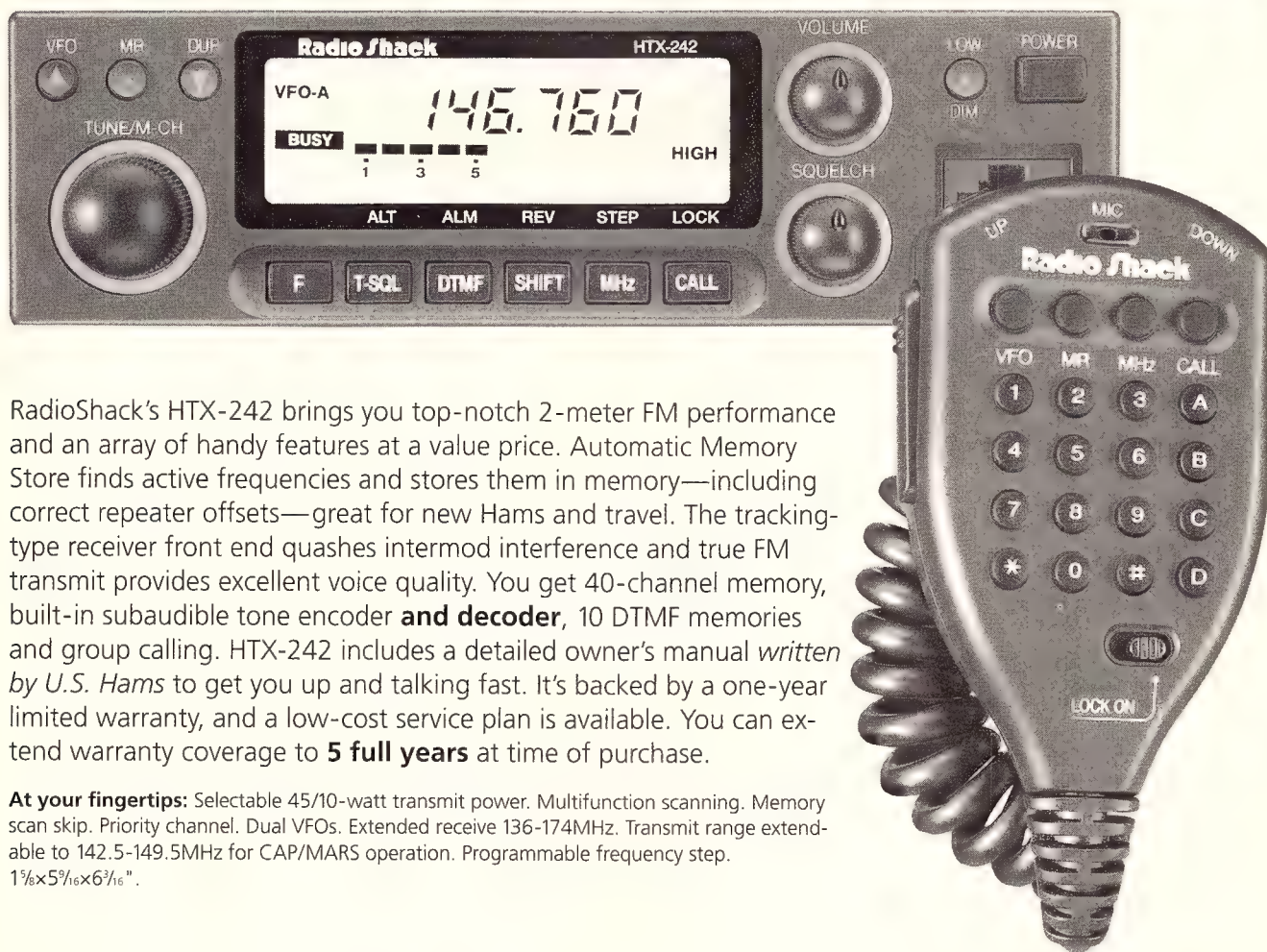
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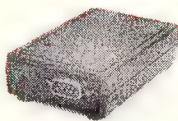
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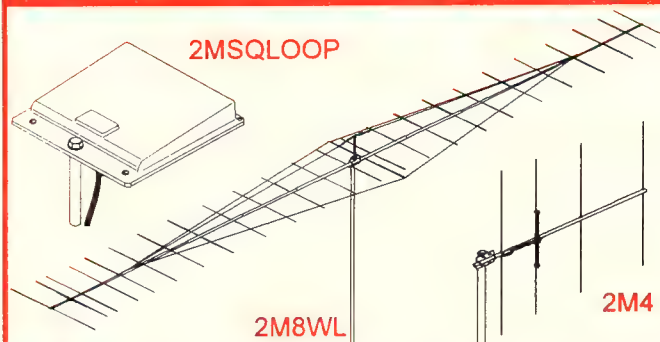
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WITH LIVE DEMONSTRATIONS AND WORKING EQUIPMENT

9:00 A.M. - 5:00 P.M. (One Hour Lunch Break) \$25.00

FIVE WPM CODE TEST PREPARATION REVIEW – 6 P.M. - 9 P.M. – \$10.00

FEBRUARY 6 – GENERAL TEST CODE AND THEORY REVIEW BY GORDON WEST

9:00 A.M. - 5:00 P.M. (One Hour Lunch Break) \$25.00

These will be Mr. West's only Southeast Coast classes, so sign up now and begin your home-study with ARRL or West materials. Contact Hamboree Chairman for full details.

FEBRUARY 6 – ARRL RF SAFETY WORKSHOP by Ed Hare W1RFI, ARRL Laboratory Supervisor

\$20.00 ARRL Members, \$25.00 Non-Members. Sign up with ARRL Education Dept., 225 Main St. Newington, CT 06111

FEBRUARY 7 - 8

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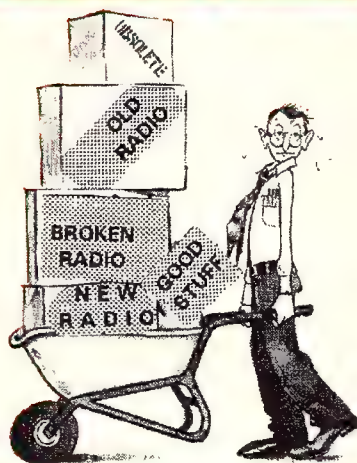
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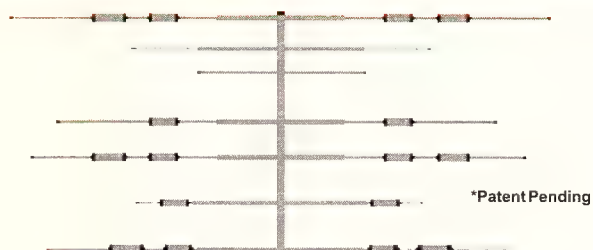
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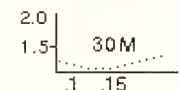
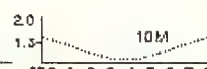
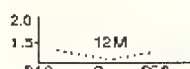
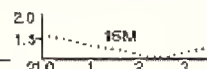
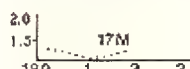
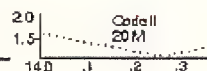
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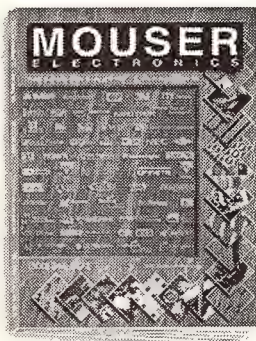
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What is Intermod?

Intermod is the common name for the interference we hear from other transmitters such as pagers, police and taxis. It stands for Intermodulation Distortion and occurs when the RF amplifier in your receiver is driven non-linear by a strong signal. Two or more signals then mix in your receiver's RF amplifier and create a signal on your listening frequency.

Here's what a DCI Filter can do for YOU!



A handheld radio usually operates properly with a rubber duck antenna, but when it is connected to a mobile or base antenna, the HT becomes susceptible to intermod. This happens because some of the signals become strong enough to drive the RF amplifier non-linear. DCI filters allow you to benefit from the gain of a high performance antenna without creating an intermod problem.

Mobile radios have better intermod immunity than handhelds, but if the signals are strong enough, mobiles too will be susceptible to intermod. Whether or not this happens depends on the radio, and the strength and frequency of the signals. Some metropolitan areas have so many strong signals that most VHF/UHF amateur transceivers experience intermod. The DCI filters are very effective in reducing intermod in high RF environments.



In many situations, a DCI filter will increase the sensitivity of a base station or repeater, particularly when using a low-noise preamp. The increase occurs because the DCI filter reduces the strength of both background noise and out-of-band signals. The result is less intermod-generated noise on your active frequency.

DCI bandpass filters are first-class filters with first-class specifications. They reduce the strength of interfering signals while allowing the signals you want to hear to pass through at virtually full strength. They're a worthwhile addition to any mobile, base station or repeater.

Features and Benefits

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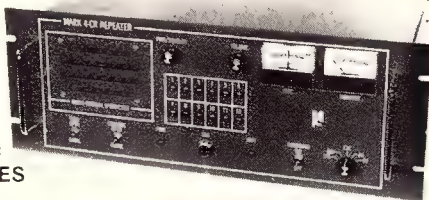
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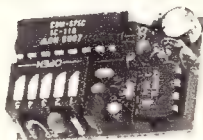
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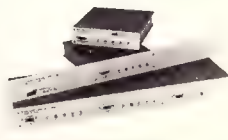
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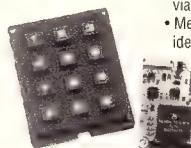
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Eagle DX

Challenger DX

Voyager DX

This chart helps you select the right GAP antenna. When comparing GAPs, bandwidth is not a concern. With few exceptions, a GAP yields continuous coverage under 2:1 for the ENTIRE BAND.

All antennas utilize a GAP elevated asymmetric feed. A major benefit is the virtual elimination of the earth loss, so more RF radiates into the air instead of the ground. This feed is why a GAP requires **NO RADIALS**. Just as elevating a GAP offers no significant improvement to its performance, adding radials won't either, making set up a breeze.

A **GAP antenna has no traps, coils or transformers**. This is important. The greatest sources of failure in multiband antennas are these devices. Perhaps you heard someone discuss a trap that had melted, arced or became full of water. Improvements to these inherent problems are the focus of the antenna manufacturer, while the basic design of the antenna remains unchanged. **GAP improved the trap by eliminating it!** Removing these devices means they don't have to be tuned and, more importantly, won't be detuned by the first ice or rain. The absence of these devices improves antenna reliability, stability and increases bandwidth.

Another major advantage to a GAP antenna is its NO tune feature. Screws are simply inserted into predrilled holes with a supplied nutdriver.

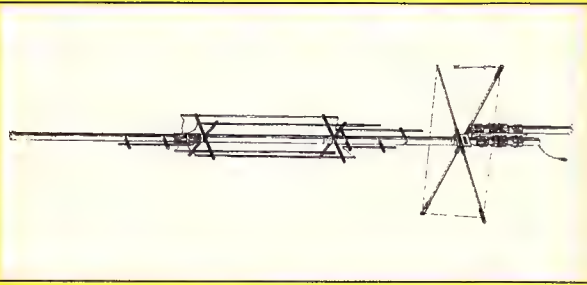
The secret is out and people in the know say:
CO—"The GAP consistently outperformed base-fed antennas...and was quieter."
73—"This is a real DX antenna, much quieter than other verticals."

RF—"To say this antenna is effective would be a real understatement. Switching back and forth on 40m between another multiband HF vertical and the GAP, there was no comparison. Signals were always stronger on the GAP, sometimes by 5 units, not just DB's."

Worldradio—"These guys have solved the problem associated with verticals. That is, an awful lot of RF is wallowing around and dropping into the dirt instead of going outward bound. A half-wave vertical does need radials if it is end fed (at the bottom). But the same half-wave vertical does not (as much, hardly at all) if it is fed in the center."

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Eagle DX		■	■	■	■	■	■	■	■	■	■	21.5'	19 lbs	1-1/4" pipe	80" Rigid	\$269
Titan DX		■	■	■	■	■	■	■	■	■	■	25'	25 lbs	1-1/4" pipe	80" Rigid	\$299
Voyager DX							■		■	■	■	45'	39 lbs	Hinged Base	3 Wires @ 57'	\$399

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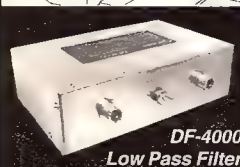
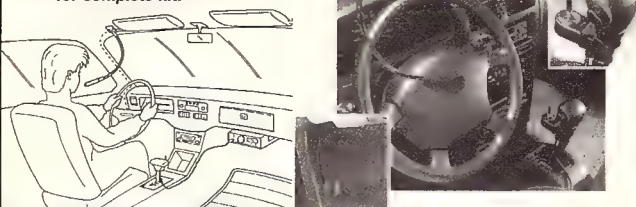
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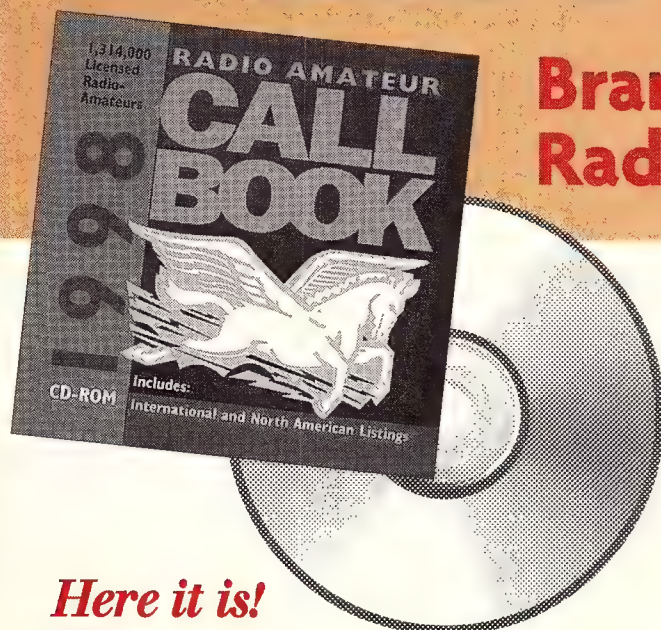
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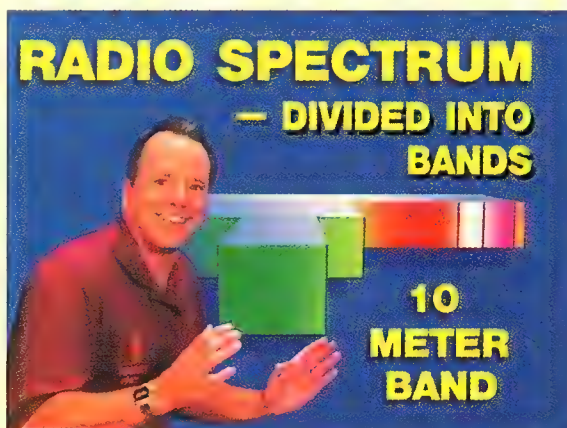
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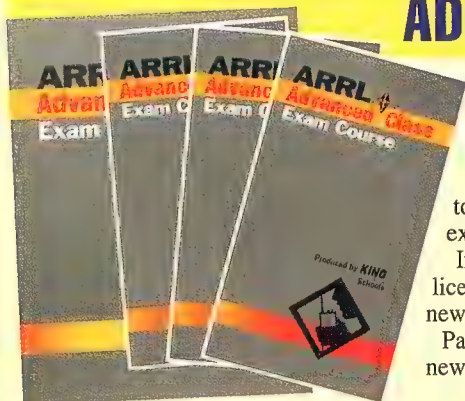
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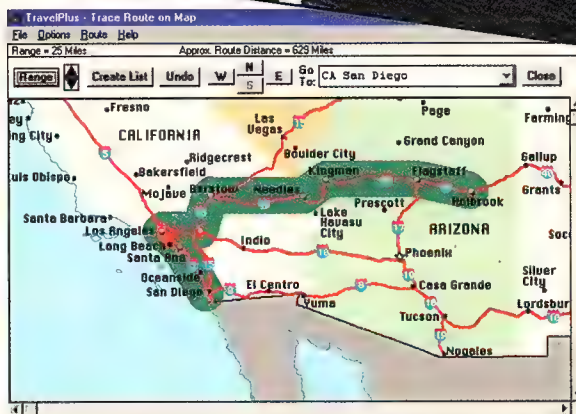
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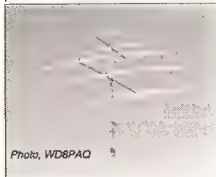
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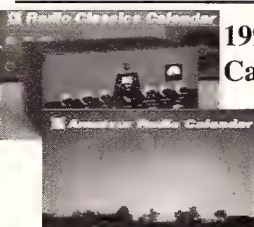
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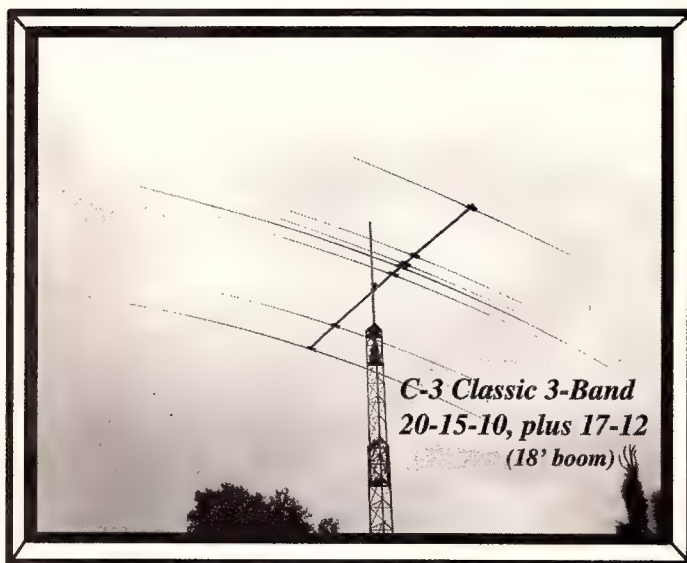
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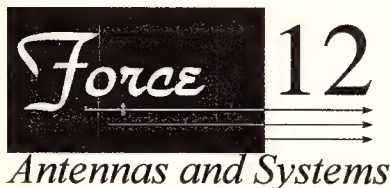
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For **ICOM IC-W21A / 2GXAT / V21AT:**

BP-131xh (NiMH)	7.2v	1350mAh	\$39.95
BP-132s (5w)	12.0v	850mAh	\$39.95
BC-601e	Rapid/Trickle Charger		\$64.95

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BP-84 pk.	7.2v	1200mAh	\$34.95
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BP-202s pk.	7.2v	1400mAh	\$29.95
IC-8	8-Cell AA NiCd/Alkaline Case		\$15.95
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PB-32 pk.	6.0v	700mAh	\$22.95
PB-34 pk. (5w)	9.6v	700mAh	\$34.95
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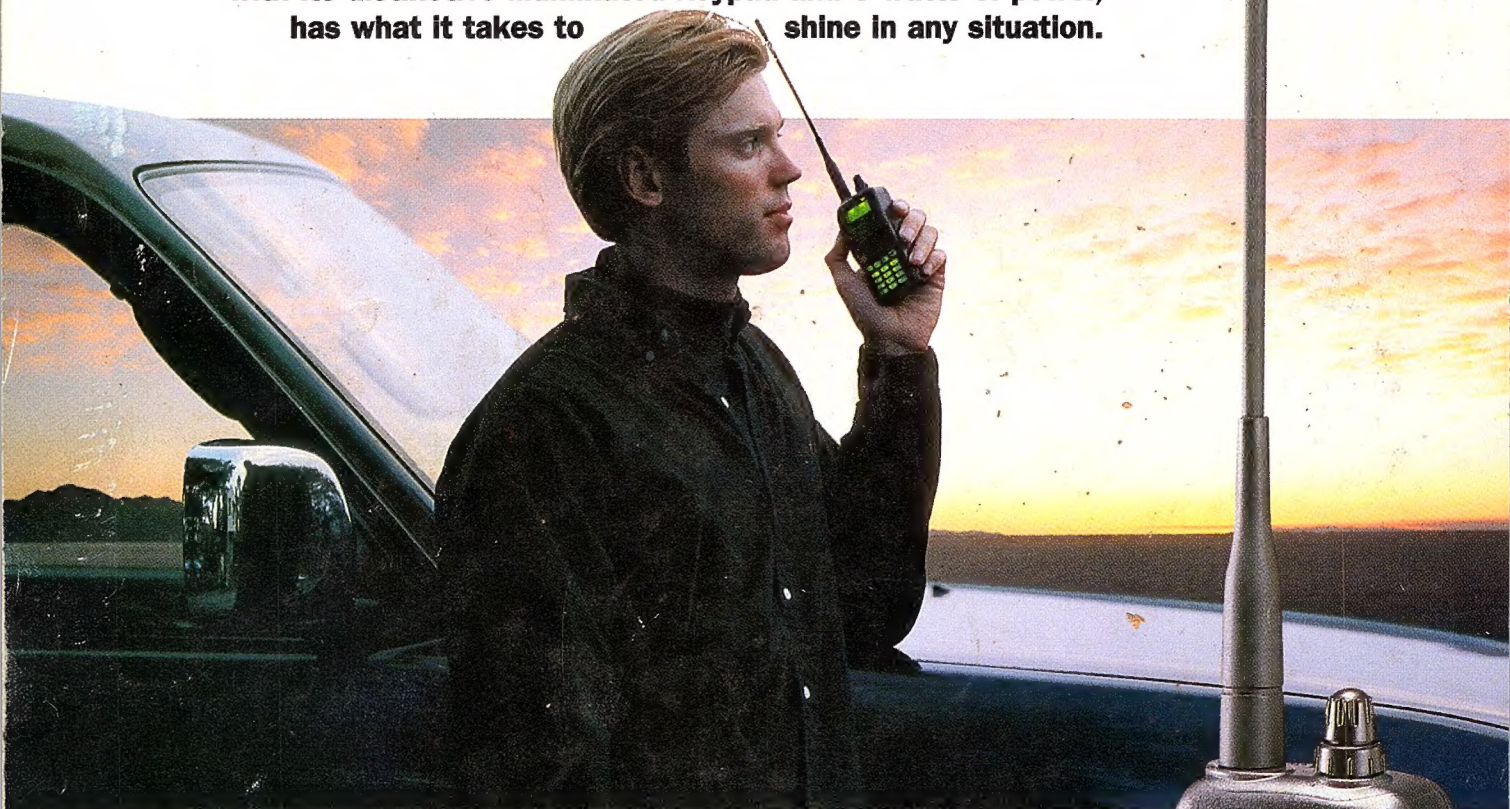


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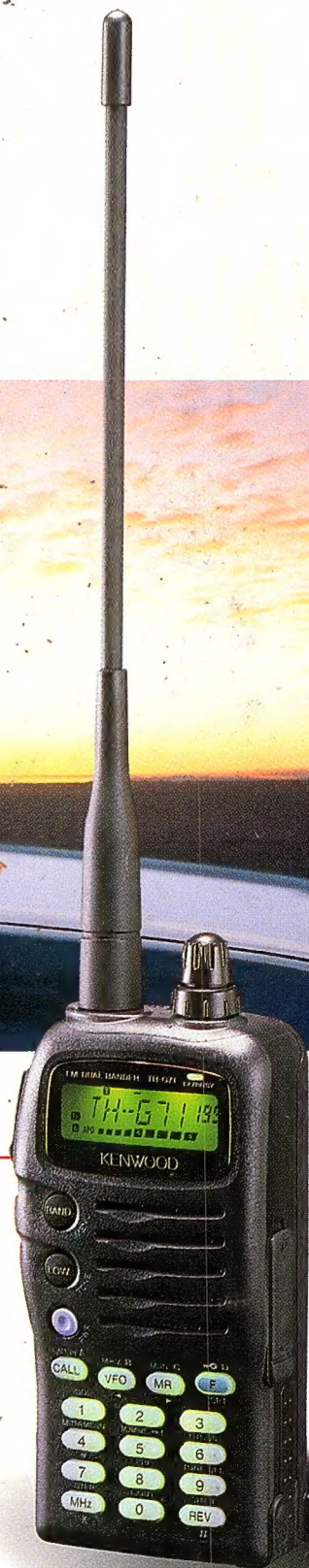
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